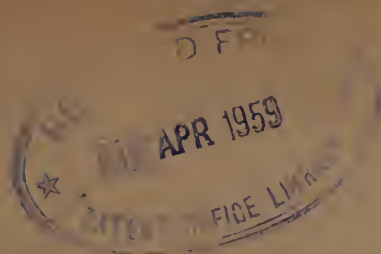


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THE
PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XII.

EDITED BY G. WHARTON SIMPSON, M.A.

Nulla recordanti lux est ingrata.—MARTIAL.

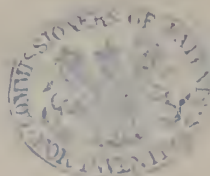
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1868.

THE CITY CENTER

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PREFACE.

THE remarks which stand in the position of "Preface" to a volume consisting of the aggregated numbers of a weekly journal, forming a year's issue, are necessarily the last words written in that volume, and afford the Editor opportunity, if need be, for observations, explanatory or qualifying, in regard to the work of the year. In the Volume just concluded we have, fortunately, nothing to qualify or explain. Our record of a year's progress in the now comprehensive field of photography, and the aids we have furnished to that progress—by the pens of our contributors and correspondents, and by our own—are before the reader, and furnish their own best explanation.

It would be now somewhat late in the day to enlarge on the aids to photographic progress furnished by photographic journalism. The unprecedented rapidity of the progress of the art, the universality of its practice throughout the world, its singular fecundity of application, and the rare perfection to which—in many respects, at least—it has attained in little more than a quarter of a century, are due, it cannot be doubted, in a great measure to the fact that greater facilities and inducements for the communication and interchange of ideas and for the diffusion of information, by means of a special press, have existed in connection with this art, than have, perhaps, ever existed in connection with any other art or science. In writing the final words of the Twelfth Volume of the first weekly journal devoted to photography, these reflections naturally occur. During the period of time which has elapsed since the PHOTOGRAPHIC NEWS was established, photographic journalism has become more extended and active: many other journals devoted to the art have sprung into existence, and, after flourishing a short time, have passed away and been forgotten; whilst this journal—the Editor makes the assertion with much gratitude as well as modest pride—has steadily progressed in influence and recognition, and in the success consequent upon the possession of these. Notwithstanding the various phases through which photography has passed as a commercial enterprise, and the different aspects it has assumed as a science and an art, the PHOTOGRAPHIC NEWS has steadily acquired and accumulated friends, influence, and

popularity, and at no period were its friends, correspondents, and contributors more numerous or more active in its interests than they have been during the progress of the present Volume, as its contents bear witness. We make these remarks rather in grateful recognition of the valuable aid we have received from all quarters, than in any spirit of vain-glory ; we make them because silence in relation to the zealous interest of so many friends would be insensibility.

All these things proved long ago the need for such records of progress and such aids to progress as we have endeavoured to furnish ; and they prove that hitherto we have not entirely failed. For the future, this is not the place for entering at large into promises or pledges. We intend that whatever has been found worthy of recognition and approbation in our programme during the past shall be retained and amplified in the future. Our own work will be the same, only conducted with augmented experience. We aim to bring under the attention of our readers everything which can in any way, intimately or remotely, affect the interests of the art or its devotees ; but we also aim to aid their judgment in relation to all that requires consideration and examination before acceptance, that they may "prove all things, and hold fast that which is good." We are assisted in this work by a larger staff of regular and occasional contributors than we have before had the good fortune to possess, an augmentation of power of which our readers will continue to reap the advantage.

Thanking our numerous correspondents and contributors for the valuable aid which, during the past year, we have received in an unusual and unprecedented degree, we wish them, our readers, and the art, a very prosperous new year.

DECEMBER 31ST, 1868.

PHOTOGRAPHIC NEWS.

Vol. XII No. 487. January 3, 1868.

CONTENTS.

was an hour and a quarter from
pared till the development."

It will be seen that in this
times the exposure he ju
the time generally judger
plates; but we may re
exposure is permissible
nitrate of silver is no
aiming at extreme d
to risk any degree
sent us a day or te Past Year
as follows:—

"DEAR SIR,—I
morphine solution By W. T. Bovey.
and in no way in phs in America.
although kept t
a valuable qua
lovers of albu

PHOTOGRAPHY DURING THE PAST YEAR.

of nitrate sil
course, amr
acetic acid, hich is just closed can scarcely be said to

As a si knowledge. And if progress could only be
keeping by the record of discoveries made, or novelties
in cou'd, the past year might not unnaturally be regarded
perim nignant and profitless one. Such an estimate would,
or, be unjust, for notwithstanding the existence of
that is depressing in the commercial condition of the
ice, and much that is unsatisfactory in its practice, the
Vntal activity which has prevailed during the last twelve
Vnthls, the anxiety which has been manifested by many to
levate the art, and to improve its results, are all illustrations
f a healthy vitality in the photographic community, and
ndications of a promising future for the art.

There has been no change made in the ordinary negative
rocess with wet collodion, although a better understanding
of some of the conditions of success has been attained.
An important aid to the preservation of plates during long
exposures has been introduced by Mr. Valentine Blanchard.
One of the chief difficulties arising during the long keeping
of wet plates has arisen from the concentration of the free-
silver solution on the plate, caused by evaporation. The
concentrated solution has at times tended to crystallize
on the plate and cause stains; at other times it has com-
menced to redissolve the iodide of silver already formed in
the film, and so cause stains. Mr. Blanchard has met the
difficulty by employing a collodion with a larger share of
bromide than usual, and allowing the plate to remain in the
nitrate bath only a short time, so that a portion of the
bromide in the film remains unconverted into bromide
of silver. The result is that the free nitrate of silver solution
left on the plate, instead of becoming stronger or more con-
centrated by evaporation, is really becoming weaker by the
process of double decomposition which is going on between
the silver and the unconverted bromide left in the plate. A
two hours' exposure in hot weather has produced no evil
results where this method has been adopted.

Matt silver stains, pinholes, and streaks, have still con-
tinued to trouble some photographers. As regards the first,
besides the above means of prevention, the remedy we
indicated a year or two ago is now generally recognized as
meeting a large number of cases. We suggested the use of
collodion which did not give a repellent film, the addition
occasionally of a drop or two of water to each ounce of
collodion, and the use of iodides with bases forming in
the silver bath hygroscopic salts. With these conditions
and usual precautions as to cleanliness of the inner frames,
little risk of matt silver stains will be incurred. On the
subject of pinholes, little or nothing has been added to our
knowledge during the year; but known remedies meet the
majority of cases. Streaks in the direction of the dip—a

PAGE

1
2
3
3
5
6
7
8

The Magic Lantern and Photography. By James Martin.....	9
Stereoscopic Micro-Photography	10
Lectures on Art	10
Correspondence—India-rubber for Mounting—Making a Bellows Camera	11
Talk in the Studio	11
To Correspondents.....	11

simple trouble which has puzzled many experienced photo-
graphers to get rid of—have made their annual autumnal
appearance; but it is now generally found that the rapid
vertical or lateral movement of the plate in the bath imme-
diately on immersion, instead of allowing it to rest for half
a minute as usual, completely removes the evil.

The importance of using a ripe collodion has excited some
attention. With a freely bromized collodion, and one in
which the iodide and bromide of cadmium is solely or
largely employed, it is found that the collodion loses nothing
in sensitiveness, and gains in many other good qualities by
months or years of keeping. The experience of Mr. Eng-
land, one of our ablest landscape photographers, verifies this
practice.

In dry collodion processes the year has been more rich in
good results than in any other branch of the art. Simpli-
city, sensitiveness, and certainty have been attained in
several processes in a higher degree than had before been
secured in dry plates. A simplified collodio-albumen process,
by Mr. England, in which the preparation of the plate is com-
pleted at one operation and with one bath, has been found in
his own practice sufficiently trustworthy to be employed com-
mercially instead of the wet process; and during the summer
he obtained by it upwards of 400 negatives of Rhine scenery.
Mr. Bartholomew's acetate of morphine process is, perhaps,
more simple and sensitive still, the exposure being less than
double that of dry plates. Its only drawback is uncertain
keeping qualities. Mr. R. Manners Gordon has worked out
a modified gum process, which in keeping qualities and
excellence of result leave nothing to be desired. A modifi-
cation of Mr. Sayce's collodio-bromide process has been
reduced to something like absolute certainty, and plates
prepared by it and sold commercially at Liverpool appear
to be, from many reports, uniformly excellent and trust-
worthy. Little difficulty need now be experienced by dry-
plate workers, since dry plates suited to almost any condition
may be readily bought or easily prepared.

There has been but comparatively little progress in enlarg-
ing processes. The most important novelty in this direction
is the application of a well-known principle to a compa-
ratively new purpose, by which very excellent enlargements
are easily produced. An enlarged transparency is taken in
the camera, toned to a suitable tint, and transferred to plain
paper; the result, if well done, is a picture resembling
an albuminized print. There are three definite advantages
to recommend this method of enlarging: it is simple,
and does not require either fresh apparatus or fresh ex-
perience out of the usual range of a portraitist's practice;
the delicacy of the image on collodion largely compensates
for the loss of sharpness consequent upon enlargement; and
there is considerable hope of permanency in a developed
print on collodion, as it has, in fact, the same bases for
stability as a negative.

In printing processes generally but little change has been made. Swan's carbon process has steadily progressed in commercial use, but has not been so generally adopted in this country as we hope to see it. In America and on the Continent it is coming into use. M. Braun, of Dornach, having hitherto adopted it most largely and successfully. Mr. Woodbury's process has not yet been commercially practised, but probably will be very shortly. There appears to be no inherent reason why it should not at once be generally adopted for many purposes. Involving, as it does, entirely new principles of printing, requiring new and costly plant, and newly trained workmen, it has laboured hitherto under commercial disadvantages which have delayed its application. Mr. Woodbury has been busy in working it out in various directions, and has during the year produced 10 by 8 pictures in all respects equal to silver prints.

Silver printing remains much as it has done for some years, its practice in skilled hands having attained a high state of perfection. Some slight attention has been given to methods of eliminating the last traces of hyposulphite from the print, but chemical modes of effecting this do not seem likely to come at any time into general practice. There is little doubt that a carefully produced silver print, fixed in plenty of strong, fresh, neutral hyposulphite solution, and then thoroughly washed, will be as permanent as an image formed of reduced silver can be; and that, kept under favourable conditions, it may have a long tenure of stability. The chief difficulty is, that however perfectly produced, the very nature of an image of finely divided silver renders it liable to change; and hence the importance and desirability of using a carbon process. Hence also the desirability of a method of protecting silver prints from the action of the atmosphere and the agencies of change which are present in it. Mr. Blanchard's method of coating the print at both sides with collodion seemed very hopeful; but some experiences during the year, which have been described in our pages, have somewhat dashed that hope. The matter still requires further testing, however; the process has too many elements of promise to be abandoned without very full trial. The method of using varnishes for the same purposes is less desirable for general use, because of the unsuitable glaze it gives the picture. The use of wax is gaining ground, as improving the appearance of the print, whilst it makes it less pervious to injury.

The use of sugar in the printing bath, specially brought under the attention of photographers in our pages by Mr. Bovey, promises to be of great value in permitting the keeping of paper without risk of discoloured prints, and also, under some circumstances, communicating increased sensitiveness and intensity. The use of a toning bath of sulphocyanide and gold has received some attention during the year, and, for certain purposes, has been found to possess good qualities. Our collodio-chloride process has come into more common use on the Continent, and M. Obernetter has prepared a stable sensitive paper by a modification of our process, the prints from which appear to be very excellent.

Photo-lithography and photo-engraving have not made much progress, especially in this country. The process of phototypic by MM. Tessie du Motay and Mareschal gives the most perfect results we have seen. The method of producing photo-engraved plates of reproductions has received some attention on the Continent, and we have seen very good results. This branch of photography, which ought to have many valuable applications, has received singularly little attention in this country.

Much interest has been excited during the year by the accounts of the photography at the International Exhibition in Paris, in which this country, from a variety of causes, presented a much worse appearance than the condition of photography in England justified. Whilst we excelled in landscape, it was clear, however, that we were behind some continental countries in the art excellence of our portraiture. The magnificent portraits by M. Salomon, of Paris, took the photographic world by surprise, and, by

their boldness and vig-

delicacy and perfect mo-

freshness in composition, } contributors more
photographic excellence were } ing the progress
dreamed of; and a new impulse } remarks rather
less been given to photographic p } of these pictures.

An exhibition of photographs headquarters, than
cess beyond anticipation. It had i- } to the zealous
rate the new session of the Photogra- } an exhibition meeting, photographers
in examples of recent progress in the, }
In the course of one evening, contrib- } of such excellence were forthcoming
of such excellence were forthcoming } progress and
desirable to prolong the exhibition for } prove that
respects it was the best photographic ex- } place for
been held in London, and exhibited a } photographers.
activity and state of progress and impro- } en found

Professional photography has continued } shall be
depression, but there are symptoms of impro- } cabinet portrait, to which we endeavoured to gi-
last year which should aid in establishing it, ha- } ducted
and on the Continent become a great success } aders
country it is progressing towards success, but ha- } yet attained that position. With increased ec- the
prosperity in the country at large, and with increa- } and excellence amongst photographers, who should 'at
a higher opinion of their art, of its possibilities, and } worth of its results, revived commercial prosperity w'e
doubt not, prevail amongst portraitists. As a contempo- } has well remarked, "The art cannot die; it must advan-
and already there are signs of a revival." That revival m- } not equal the prosperity which attended the card man-
but it will bring success to those who deserve it.

Death has been busy amongst the ranks of vet- } i.
photographers during the year. M. Claudet, the c } professional photographer in London,—one who P
laboured with love and earnestness for the promo- } of the art for upwards of a quarter of a century,—is
gone. Mr. J. F. Goddard, another of the oldest workers, is } also dead. Mr. Mawson, a name long familiar in connection
with the preparation of photographic chemicals, was lost to } the art by an untimely death. The Duc de Luynes, a name
long associated with the promotion of permanent printing, } and the prizes he offered to stimulate the production of such
a process, he also is gone. Mr. Malone, an early worker in } conjunction with Mr. Fox Talbot, is also amongst the men
that are gone. The melancholy thought presses itself on } the mind that the time is coming on when the names of the
pioneers of our art will pass out of the field of action into } the domain of history.

Let us all strive to do some work for the art first, and let } us work while it is called to-day. In conclusion, we greet
readers, friends, and correspondents with wishes for a } happier and more prosperous new year than that has been
which has just closed.

THE MOIST MORPHINE PROCESS.

SOME further accounts of the moist acetate of morphine } process for keeping plates a few hours are very promising,
and the simplicity of this mode of preparing plates for long } exposures, or to be carried a distance, without the delay in-
volved in using dry plates, possesses many advantages. Mr. } Burgess writes, a few days ago :—

"I took out with me a plate prepared by thorough wash- } ing and dipping in one grain solution of morphine. I gave
two minutes' exposure with Dallmeyer's stereo lucas, No. 4 } stop. I should have considered thirty seconds sufficient for
an ordinary wet plate. Developed with iron and gelatine, } the result was a well-exposed, perfectly clean negative, about
the same colour and density as an ordinary negative. It

was an hour and a quarter from the time the plate was prepared till the development."

It will be seen that in this instance Mr. Burgess gave four times the exposure he judged necessary. This exceeds the time generally judged necessary for the dry morphiue plates; but we may remark that considerable latitude of exposure is permissible with most processes in which free nitrate of silver is not present, and Mr. Burgess, always aiming at extreme delicacy in his results, is not likely to risk any degree of under-exposure. Mr. Bartholomew sent us a day or two ago a further hint on the process as follows:—

"Egham, Dec. 29th, 1867.

"DEAR SIR,—I find that one-fourth part glycerine in the morphine solution perfectly effective to keep a plate moist, and in no way interfering with sensitiveness or development, although kept twenty-four hours after preparation. This is a valuable quality on an emergency in hot weather. The lovers of albumen should try the acetate morphine in place of nitrate silver in the albumen coating of the plates. Of course, ammonia must not be present, but, if anything, acetic acid, in the albumen.—I am, dear sir, yours faithfully,
WM. BARTHOLOMEW."

As a simple method of preparing plates for a few hours' keeping is one of the wants of photography, we have pleasure in commending this use of acetate of morphine to our experimental readers.

THE LATE M. CLAUDET.

We closed our last volume with the record of the death of one whose name had long been familiar to photographers, and we have the melancholy task of ushering in a new volume with a similar chronicle. Antoine Jean Francois Claudet, F.R.S. and Chevalier of the Legion of Honour, died suddenly at his residence in Gloucester Road, on Friday last, in the 71st year of his age. He had been active and vigorous and well up the time of his death. A recent accident in getting off an omnibus had confined him to the house for a few days a short time ago; but he had recovered, and had himself assured us, recently, of his perfect vigour. About a week before his death he called upon us and left a message asking us to see him shortly, as he had an interesting novelty to bring under our attention. The day before Christmas Day he made various appointments, and planned various duties at the studio in Regent Street, for the Friday following, on which day he suddenly died.

The labours of a life so devoted to photography as that of M. Claudet demand a more extended notice than we can give now; but a brief note of the prominent events, chiefly within our own recollection, may be interesting here. Although, as is well known, a Frenchman by birth, M. Claudet had been upwards of thirty years in this country, about eight and twenty of which had been devoted to photography. At the time when the discoverer of the Daguerreotype process was liberally pensioned by the French Government, in order that the art might be as free to the world as the sunlight by which the results were produced, a patent was secured in this country, and M. Berry, the agent in the transaction, had this patent for sale. M. Claudet—then engaged in the glass trade, as the partner of Mr. Houghton, a partnership which has since continued—became the possessor of a part, which consisted in the right to use three cameras in practising the then undeveloped art, portraiture not having at that time been attempted. Mr. Beard soon afterwards bought the patent, or the remainder of it, and commenced, in 1840, the production of photographic portraits. About the same date, but a little later, M. Claudet commenced the practice of portraiture in the Adelaide Gallery, where his studio remained for many years. Mr. Beard, not being aware of the nature of the rights in the patent previously acquired by M. Claudet, was not prepared for those operations in portraiture, infringing what he conceived to be

his sole rights, and applied for an injunction to restrain M. Claudet from the practice of photography. The latter gentleman, however, made good his claim, and has continued the practice of portraiture to the present day.

Having once entered into photography, he devoted himself ardently to its improvement and development, and has been always one of the most zealous workers in its promotion and elevation in all respects, as science, art, and profession. During the first year or two of operations in portraiture, a single achromatic meniscus lens was used, the diameter being about one inch and the focus three inches, the size of the plate being that known as the sixth size, or $3\frac{1}{4}$ by $2\frac{3}{4}$ inches. For years it was the practice to place the sitter in the open air to secure the most uninterrupted light. Much has changed since then, at least in the appliances of the art, although a serious question may be raised as to whether improvement in results has kept pace with improvement in means and appliances.

The earliest of M. Claudet's contributions to the art was a mode of obtaining increased sensitiveness by using chloride of iodine, instead of iodine alone. The use of bromine, however, superseded the use of chlorine, and M. Claudet availed himself of it, using a mixture of bromine and iodine as his second coating on the silver plate. The paper on the use of chlorine in the Daguerreotype process was read before the Royal Society in 1841, and his communications to the scientific progress of the art since that time have been constant. Although it is to the Daguerreotype process his experiments have been mainly confined, he took up the Talbotype process at a very early period, and was one of the earliest in the production of photographic portraits on paper. With the Daguerreotype process he was especially enamoured, and was the last to discontinue the practice of Daguerreotype portraiture in London. We are not certain that he did not up to the present time occasionally practise this process.

Of his multitudinous labours we cannot speak in detail now. His name is associated with so many inventions that we cannot in a brief obituary notice recall all. His dynactinometer, his photophometer, his focimeter, his stereomicroscope, his experiments in connection with binocular vision, his system of unity of measure for focussing enlargements, his moving focus and focus equalizer, his system of photosculpture, and many other results of his experimental researches, are familiar to most of photographers.

His contributions to photographic literature were copious and interesting, the idiomatic excellence and elegance of his English being remarkable. Although the scientific aspects of the art claimed his first attention, he was ever the ready and eloquent champion of its art claims. In controversy he was able and acute, but free from bitterness or acerbity, all his communications being eminently courteous and conciliatory. For many years he was a member of the Council of the Photographic Society, and frequently contributed to the proceedings. He had attained high recognition of his many labours, and, in addition to many medals, was a Fellow of the Royal Society and a Chevalier of the Legion of Honour.

Although he had attained the age of three score years and ten, he was still active and energetic in his experimental researches into the science of the art, literally dying in harness.

Critical Notices.

VIVIEN AND GUINEVERE. By ALFRED TENNYSON, Poet Laureate. With Eighteen Photographic Illustrations, from Drawings by GUSTAVE DORE. (London: Edward Moxon and Co.)

The notion of Dore's illustrating Tennyson seems at first sight altogether incongruous. What, it is naturally asked, can the exuberant and bizarre genius of the great French

artist have in common with the essentially English idyllic poetry of Alfred Tennyson? In giving form and life to thoughts of the wits and humourists of his own country, in depicting the grotesque situations of Don Quixote, in becoming co-creator with Dante of some of the scenes of the Inferno, and even in giving pictorial embodiment to some of Milton's grandest imaginings, we can understand Dore's success. But the unexaggerated sweetness and simplicity of Tennyson's style, even in dealing with English legends of heroic deeds in a period in which history and fable are undistinguishable, are the last qualities which it might readily have been said were suited to the pencil of Gustave Dore. Yet there are few, we imagine, who have seen his illustrations to *Elaine*, who will not look with eagerness for those to *'Vivien and Guinevere,'* and regret that they must wait for twelve months before his illustrations of *Enid* will be issued. Few who have once seen it will readily forget the solemn grandness of that picture of "the dead steered by the dumb" which formed the frontispiece of the first volume of his illustrated Idylls.

On second thoughts, few, even of those disposed to deny Dore's fitness for illustrating Tennyson, will be disposed to deny that something more is needed in the illustrations to a great poem besides moderately well drawn but slavish renderings of the text. These add nothing to the work of the poet, but often rather cumber it, and render it commonplace. Worthy illustrations to a great poem should excite the imagination in the same manner, if not in the same degree, as the poet has done. It is of less importance that he should servilely depict what the poet has described, than that he should catch the spirit of his author, and clothe upon it after the fashion of his own genius. In the works of M. Dore this mode of dealing with illustrations must inevitably be the case; the individuality as well as the originality of his genius is perpetually manifested, and if he fails at times in embodying what Tennyson describes, he always produces a grand picture which is imbued with the spirit of the scene to be rendered.

In "*Vivien and Guinevere*" M. Dore has entered more fully into the spirit of Tennyson's poetry than he succeeded in doing in "*Elaine*," and we have some of the most exquisitely tender and beautiful scenes which he has ever drawn. The Dawn of Love in "*Guinevere*" is an admirable example of this. The scene depicted is that in which Lancelot and Guinevere ride together in Maytime towards Arthur's court,

"Under groves that looked a paradise
Of blossom, over sheets of hyacinth,
That seemed the heavens upbreking thro' the earth."

Nothing can exceed the sweetness of this springtime landscape, the fullness of colour, and the glad beauty of everything which surrounds the knight and the lady in the dawning time of that unfortunate love. In "*Vivien*" we have examples of the half-grotesque, half-weird grandeur of Dore's pencil in the scenes in the wood, between Merlin and the lissome Vivien. We might point to almost every picture as having its especial point of excellence well worthy of the attention of the art student for lessons in composition, as well as of the admiration of the general reader.

The especial claim of this edition upon the attention of our readers is the fact that M. Dore's drawings are here rendered by photography, instead of by means of wood engraving, in which form his drawings are most familiar to the public; or by steel engraving, as in another edition of this work issued by Messrs. Moxon and Co. The drawings of Dore essentially demand the truth of photography if it be desired to see him in the original, and not in translation. The broad washes in which they are executed, the free use made of body colour, give a character too often lost in any method of engraving. Mr. W. Jeffrey has done the fullest justice to the artist, his reproduction leaving little to desire. Even by means of photography it is easy to miss the spirit of a picture in reproducing it. Under-exposure or over-exposure, under-intensifying or over-intensifying, over-hardness or

lack of vigour in the negative, or lack of judgment in the printing, would alike tend to mar the result. In the reproductions before us the photographer has done full justice to the artist, and we have rarely seen a series of more uniform photographic excellence. The work is one of which poet and artist, photographer and publishers, may alike feel proud of a share.

THE LANDS OF THE BIBLE. A Series of Stereographic Pictures, by FRANK GOOD, 47, Minories.

Mr. FRANK GOOD has, during the last two or three years, been rapidly winning a position as one of our first landscape photographers, and the series of stereographs before us will go far to render that position unchallengeable. We have in most of these pictures something more than good photography, although that characterises the series throughout in a degree rarely attained in Eastern photographs. Especially noticeable throughout is the artistic feeling which pervades the treatment of every subject admitting of choice or discretion, such as the careful selection of point of view, the judicious lighting, and the degree of tenderness and delicacy, or vigour and brilliancy, imparted to each picture, as the nature of the subject may have rendered desirable. Here is Nazareth (No. 41 of the series): a distant view of a town or village is rarely a picturesque subject, however interesting its associations; but we have here a bold, effective foreground of upland and stone and bush, with well-placed figures; the town occupying the distance and middle distance, and an effective sky and clouds giving harmony to the whole. The Sea of Bethsaida (No. 46) is another charming picture, well composed and full of atmosphere, a calm beauty pervading, such as might fitly have been given by a painter as a poetic treatment of a scene associated with such sacred memories. Of Jerusalem we have many views, all fine, and some very full of meaning: in one we have Turkish tombs and Arab shepherds as the leading feature; in another, Latin monks; whilst in a third the fine Hebrew masonry of the Well of Wailing has survived the changes which time has effected on the fortunes of the once holy city. Of Sinai we have also several excellent views; one of the best of which gives a view of Mount Horeb, with three Eastern figures seated on some stones in the vast amphitheatre formed by the hills.

The judicious introduction of figures harmonizing with the spirit of the scene and aiding the effect of local colour is a distinguishing feature of Mr. Good's pictures. At times it is made valuable in increasing the effect of desolation and of space in a gigantic ruin; and at other times is effective in giving the effect of the modern life of an ancient city. Of the former effect we have a striking example in the two or three figures, looking like pigmies, in their comparative little-ness, in the remains of the vast amphitheatre of the Temple of Bacchus. Of the effect of modern Eastern life we have many instances, both in the town and desert: here is a crowded street scene in Cairo, and here are European travellers on dromedaries led by Arabs.

The presence of skies with fine clouds, and the feeling of space and atmosphere, is more apparent here than in the majority of Eastern pictures. Nothing that we have seen of its kind exceeds in this respect a General View of the Temple of Jupiter at Baalbek (No. 66). Standing alone amid the ruins of its broken columns, splendidly lighted, with an admirable sky, this is a subject of rare grandeur, a fine example of breadth of treatment, and altogether a charming picture. Scarcely less effective is a view of the Sphinx and Great Pyramid (No. 97), taken under a blazing Eastern sun and cloudless sky; yet still a perfectly harmonious picture, giving a satisfactory sense of the solitary grandeur of the head which has for so many centuries been

"Staring right on with calm eternal eyes."

The Caryatides at Athens (No 84) is a very fine example

of lighting, a slanting cast shadow, from the eutablature resting on the figures, playing an important pictorial part in slide. We might multiply examples of distinctive excellence, but our space forbids. We have said enough to point out the presence of fine artistic taste and definite design and understanding of the work which characterizes these pictures, and which we have pleasure in noting is a growing feature in photography, of a very hopeful character.

SUNSET ON THE SEA. Photographed by H. SAMPSON, Southport.

This is one of those rarely beautiful examples of nature's pictorial effect which only instantaneous photography can render. The sun is hid by a grand mass of cloud, the edges of which are fringed with light. Immediately underneath, and in the track of light which the sun's rays form on the dark face of the sea, is a small sailing-boat, the only object visible, except the sea and sky and sun-fringed cloud, all of which combine to form an exceedingly charming picture. The print is with much taste cut into a circular shape, mounted on india-tinting, and is altogether very effective.

A VIEW OF NEW YORK, from Hoboken. Photographed by J. C. BROWNE.

This is a charming photograph with which we have been favoured by one of our American readers as an illustration of the working qualities of Zentmayer's lens of $5\frac{1}{2}$ inches focus, the picture being eight inches on the base-line, and the amount of angle included, therefore, upwards of 70° , the definition being satisfactory throughout. This is attained, however, by the use of a smaller stop than we think desirable for any purpose where a satisfactory effect of relief and distance is to be obtained, the aperture here having been one-fiftieth of the focal length of the lens. The value of small thin lenses is, however, illustrated by the fact that, notwithstanding the smallness of the aperture, the exposure in this instance was not more than forty-five seconds. As a picture and an example of photography this photograph is most charming. Notwithstanding the unpromising effect of a subject consisting of a distant view of a city, with a river and the two parallel lines formed by its banks for the middle distance, these are so broken up by taking advantage of some shipping, and even by the aid of such unpicturesque objects as telegraph poles, that a very fine composition is secured, the well-placed figure of a girl in the foreground very materially aiding the effect. The picture is full of space and atmosphere, and is altogether charming.

STEREOGRAPHS OF AMERICAN SCENERY. By PROFESSOR TOWLER, M.D.

Our friend, Professor Towler, with whose name and writings all photographers are familiar, favours us with some pleasant transcripts of the beauties with which America abounds. These chiefly consist of rock and cascade scenery in the neighbourhood of Seneca Lake, the scenes all selected with an artist's eye, and photographed by a master hand. Our friend kindly invites us to spend a few weeks photographing with him in camp next summer at the Niagara Falls, and gives us his address as a tent on the College Grounds near the Rapids! How we should enjoy the trip, and the company, and the occupation, if the rendezvous were not just a few miles too far distant to permit us to discharge our duties on the News at the same time!

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

MEN THAT ARE GONE—THE STATUS OF PHOTOGRAPHERS—INDIA-RUBBER FOR MOUNTING—SIMPLE METHOD OF ENLARGEMENT—SOCIETIES.

ANOTHER year's requiem has been sung, a year of some depression and of many sad memories, the last of which is

the loss to photography of an old knight and a true, Antoine Claudet. He was a middle-aged man when photography was in its cradle, and has watched it grow into a giant spreading its arms over the civilized world, shedding the light of its countenance in every spot where human affections find a dwelling-place, in camp and cabin, palace and cottage. He had seen this growth, and gallantly aided it. Few men ever gave such a whole-hearted devotion to an art. He was ever studying the subtleties of its scientific phases; he was actively alive to anything affecting its artistic character, and one of the readiest and ablest of its champions when its art claims were brought into question. In the late diffusion of focus question we did not all agree with him as to the best means of securing a given end; but few could deny that he ably pointed out a very definite lack in the art character of most photographic portraits, and that by his earnestness and energy he secured an amount of attention for this phase of the subject which it sorely needed; and in the discussions which arose on the subject he showed how it was possible to conduct a scientific controversy with firmness and decision, and maintain at the same time the perfect courtesy of a gentleman. Peace to his memory, which will live in the history of the art.

Others, too, are gone, and the echoes still vibrate with the sad story. But enough: it shall not be repeated here.

A topic which has always interested the "Old Photographer" has been the subject of two papers, some correspondence, and much talk during the month: How can the status of photography or photographers be raised? it is asked. Perhaps a question might fairly follow, Is the status of the art or its adherents lower than it deserves to be? What is the status of the art? It is practised by every class in the kingdom: royal fingers are occasionally found engaged in it; noble gentlemen and ladies are found amongst its amateurs; it is practised with zeal in what are termed the learned professions, the church, the bar, and medicine; and in the army and navy it is a favourite accomplishment. No art, in fact, can boast a wider popularity by amateur practice amongst all classes of the community, the most noble as well as the most plebeian. The status of the art itself, then, cannot well be complained of. It is true its position as a fine art is not as thoroughly recognised as some of us could wish; but that is not quite unnatural. In the first place, the art is young, and elder sisters are proverbially slow to admit to terms of equality the young chits of girls. Photography must undergo her period of probation, and make good her claims, before she can be unhesitatingly admitted into the sisterhood of the arts. The more guarded a circle, the more a position within it will be valued; and it must be admitted that much that has been perpetrated by photography has not been of a character to qualify her for a position in the sacred circle. Still, in the status of photography itself there is little to complain of.

But it is the status of professional photographers which is to be raised, and this, I must confess, is a far more difficult question. But again, I would ask, is the status of professional photographers lower than they merit? I shall be the last person to ask this question offensively. I shall be the first to commend any effort to raise their status and to increase their prosperity. But it is as well to be honest in dealing with such a question. Is the social position and recognition of photographers as a body lower than their education and character entitle them to occupy, or than they would have occupied if they had been engaged in some other mode, possible to them, of making an income? And, further, is the income derived from the professional practice of photography less than would have been made by the same persons by other modes of making an income possible to them? I do not attempt to dogmatize, but I think that both these questions must be answered unhesitatingly in the negative. Further, I think that, in many instances, photography has been the means whereby many have acquired much larger incomes, and have risen to a much higher status, than they would otherwise have secured. Doubtless they were the men

who possessed naturally the element for rising. But to rise two conditions are necessary: the ability and the opportunity. The men who have risen possessed the ability, and photography afforded the opportunity; and to photography many of them have much reason to be grateful as a means of better income and higher status than they might otherwise readily have acquired.

That photography, as a profession, should have a high conventional status is scarcely possible. The bases of conventional status in professions are qualification and limitation or exclusiveness. In the learned professions only the limited number can enter, who by means and education can acquire the qualification and the prescriptive rights appertaining thereto. To belong, then, to these professions not only confers status, but is *prima facie* evidence of possessing fitness for it. In the practice of the liberal arts an aspirant has to make his own status, win his own spurs; and a painter or a sculptor who, either in virtue of great genius or careful education and earnest culture, cannot produce works of art, will not only never acquire any status in these professions, but can scarcely acquire a recognized position in their ranks. But how is it in photography? How are the qualifications for practising it obtained? Whence come the men who practise it professionally? The very fact that they spring from all conditions in life is one circumstance which must deprive the profession as such of any especial status. The men who, educated for other positions, have adopted photography and succeeded, who have won their spurs by natural aptitude and careful culture, do acquire status, and have no need to complain. Men of less skill and culture, however, clothed with privilege or dignified by diploma, could not command status or recognition if they produced inferior work. In short, the argument resolves itself into a nutshell: every photographer can make his own status. If his work be good and his mind cultivated, he will secure both profit and position. Public recognition alone can confer status, and good work alone can secure public recognition; and in proportion to the number of skilled artists and cultivated gentlemen in the profession, so will the general status and recognition of the profession stand in the public mind. To secure the desired improvement in this respect the process of natural selection, referred to in your pages last week, must take place. I agree with the writer, who remarked, that "the strongest will excel, and excellence will succeed, and the weakest will go to the wall."

I have noted with some interest a slight tendency amongst some photographers to revive, or rather to introduce as a novelty, the use of india-rubber for mounting prints. It is really one of the oldest materials which have been used for the purpose. I have used it a longer time ago than I care to say. For mounting prints in albums, and avoiding cockling, it is of undoubted value; but I fear that much disappointment will be experienced if it be much used for ordinary mounting purposes, as many of the prints will, unless I am mistaken, leave the card. The adhesion cannot be so perfect as that secured by paste or glue. I imagine, however, that the cost will effectually check its general adoption. If the claims made for it—of adding to the permanency of the print—be verified, I shall be glad, however, to see it again tested.

I have been much pleased with a sight of some enlargements produced by the simple method recently described in these pages. Is it not surprising that a method so easy and so obvious should have so long remained neglected? Any photographer who has or can contrive a camera extending two or three feet may produce such pictures with little trouble; and, if managed with skill, the effect is really beautiful. The question of toning seems to present some difficulties, as most of the specimens I have seen are too cold; but that is a difficulty which will doubtless be overcome if the method come into practice as much as it deserves.

At the Photographic Societies the most important topic

has been the status of photographers, to which I have already adverted, and which has been discussed at two meetings,—those of the Parent Society and the South London. At the latter an interesting paper on clouds was read by Mr. Howard, illustrated with some capital examples. I take it that when a photographer can conveniently secure clouds in his landscape negative he assuredly will do so; but as there are many occasions on which good pictures can be obtained in which there are no clouds in the sky at all, and many occasions when none that are in the sky come within range of the lens, few photographers, caring for pictorial excellence, will neglect the valuable aid to harmonious composition which double printing offers them, and the advantages of which Mr. Howard so well illustrated. At the North London Mr. King again introduced architectural photography,—a hobby which he likes to ride, and which he rides well. His advice to photographers to study a little of architecture to enable them to photograph with judgment and select the objects and parts of things worth rendering, is worthy of hearty endorsement; the more so that most men who commence to study architectural art with an ulterior purpose will continue it for its own sake, finding in it its own exceeding great reward, as opening out pleasures and the perception of beauties of which the uninstructed little dream. At the Manchester Society Mr. Winstanley read a good paper on enlargements. In the course of the evening the subject of india-rubber mounting was discussed, and from some of the examples exhibited my opinion of the imperfect adhesiveness appears to have been confirmed. At the Edinburgh Society a capital address was delivered by the President, who rightly enunciated the Horatian maxim, that as neither gods nor men can tolerate mediocrity in poetry, it ought not to be tolerated in photography. Mr. Slight also read an excellent paper on Societies. The South London Society held its annual dinner, which was a pleasant social meeting, and the community which exists amongst the arts was illustrated by many of the members giving tastes of their high quality as musicians, and some as humourists and lyrists, three original photographic comic songs having been sung on the occasion.

In conclusion, the "Old Photographer" wishes to the numerous friends and readers of these pages the happiest of happy new years and all prosperity.

Foreign Miscellanea.

At the last meeting of the Paris Photographic Society, held on the 6th December, M. Despaquis invited the inspection of the members to some specimens of carbon printing upon sheets of mica. Although the material used was by no means of the finest quality, the prints, when viewed as transparencies, presented no apparent defects to the eye, but were of surprising fineness and delicacy.

At the same meeting M. Davanne exhibited, in the name of M. Manillier, a very simple piece of apparatus designed for the purpose of facilitating the mounting of photographs. It is composed of two sheets of cardboard put together in the form of the cover of a book. The inner surface of one of these boards is covered with white varnished paper, on which are traced horizontal and vertical lines dividing the surface into a large number of squares of equal dimensions. The two lines crossing the middle of the card in the direction of length and breadth are numbered from the centre, where they bisect one another at right angles, the numbers being repeated on each side. A print which has been coated with mounting material is placed face downwards on this species of draught-board in such a manner that the centre of the picture exactly covers the middle of the cardboard (where the two central lines cross one another); this is easily done by placing the extreme corners of the print upon such squares as bear similar numbers. The mount is then fitted over the squares in the same manner, the margin being allowed for and calculated from the number covered by the print; the two boards are then pressed firmly together, and the picture is mounted in a very prompt and accurate manner.

M. l'Abbe Laborde read a paper on the causes which, beyond the action of light, tend to alter the blacks and whites of photographic prints. He attributed a great deal of the alteration to the deposition upon the print of a small quantity of mobile silver, which during the treatment of the print in the different operations is moved from one portion of the picture to another. To remedy this inconvenience M. l'Abbe Laborde recommends the employment of a bath, after the prints have been fixed, composed in the following manner, viz. :—

Bichromate of potash	...	...	3 grammes
Perchloride of iron	...	...	1 gramme
Water	...	...	150 grammes

In the *Moniteur de la Photographie*, M. Leon Moock reports progress with regard to the formation of an association of operators and others connected with the art of photography in Paris. By combining together, M. Moock is in hopes that the position of photographic *employés* will be notably improved, both from a moral and pecuniary point of view; he asks for immediate and energetic co-operation, both on the part of masters and assistants.

La Science pour tous makes the following statement with regard to foggy baths:—"Sometimes when the plate is removed from the bath it is found to have become fogged, and when the image is developed the latter is found to be quite useless. M. Torry, who has carefully studied the question, asserts that fogging is never met with excepting in baths containing impurities, and that it is an error to suppose that old baths are the cause of fogging, for experience has shown that baths of this description always furnish clear negatives. Old baths lose their sensitiveness, but have no disposition to fog.

"The real causes of this inconvenience are: firstly, the presence in the bath of small quantities of developing agents derived from the hands of the operator when coating a plate previously to its immersion in the silver bath; and, secondly, the employment of alkaline collodion. It is well to prepare one's own collodion, as all collodions of commerce are of an alkaline nature, and are incapable of furnishing negatives of a very transparent character. To prevent the apparition of fog in negatives, it is merely necessary, therefore, after having prepared a bath of the greatest purity, and renounced the use of alkaline collodion, to see that the hands are perfectly clean during the operation of coating the plate, and to take care that the bath is always properly covered, so as to ensure its preservation from any impurity.

A correspondent of the *Moniteur* extols the beauty of the glazed leptographic paper, but recommends the coating of prints prepared from the same with a preservative solution after they have been toned and fixed, as during the operation of mounting the prints are not unlikely to be injured. When, therefore, the prints have been washed and dried, they are coated with albumen (half water and half white of egg) by means of a tuft of wool dipped into the mixture and drawn slowly over the surface to prevent the formation of froth and air-bubbles. After drying, the surface cannot be injured by friction, and the pictures gain considerably in brilliancy.

M. Thomas writes in the *Archiv* that he has been making a careful trial of Professor Towler's nitro-gelatine developer, but has been unable to obtain successful results. He believes that probably Prof. Towler has used a description of gelatine which he is unable to obtain, or possibly there may have been an error in the formula.

The *Photographische Correspondenz* contains an exhaustive article, by M. Alois Nigg, on the best method of building photographic studios. M. Nigg goes fully into all details, and explains his ideas by means of well-drawn diagrams.

The *Archiv* recommends the lacquering of all zinc vessels used in photographic operations, as pictures manipulated therein are apt to contract yellow stains when allowed to remain in contact with the metallic surface.

In the *Mittheilungen*, M. Weber communicates a formula for obtaining a good negative varnish. It is as follows:—

Best yellow shellac	...	...	1 lb.
Alcohol	...	...	2 lbs.
Ordinary resin	...	...	z
Venetian turpentine	...	...	1 oz.

The shellac does not dissolve entirely, and the thick, turbid solution is filtered through coarse blotting-paper, a little more alcohol being added if necessary. To clarify it, the mixture must be allowed to stand for some time. It is poured over the

plate in the usual manner, the latter being slightly warmed previous to the operation.

M. Weber likewise makes known (in the same journal) a very simple means of copying and enlarging cartes-de-visite and other small photographs. By the employment of a very simple piece of apparatus he is able to prevent—at any rate to a very great extent—the mealiness and granular character generally presented by a copied or enlarged photograph. The apparatus he uses is a kind of box—or, more strictly speaking, a tray or trough of cardboard—the four sides of which slope inwards towards the bottom at an angle of 135°, and are covered with tin-foil; the picture to be copied is fixed at the bottom of the apparatus, and the whole hung up in the front of the lens. A photograph is then taken in the ordinary manner, when it will be found that the reflection obtained by means of the tin-foil from all sides will have the effect of securing a picture almost perfectly free from grain.

At a recent meeting of the Berlin Photographie Society, M. Linde, of Gotha, exhibited a camera constructed to open and close by mechanical means, so that the period of exposure might be regulated with the greatest nicety and precision. When the time of exposure has been fixed upon, a hand is moved to the desired figure on the second dial, the camera is opened, and the clockwork set in motion; the apparatus then closes of itself at the prescribed moment. The apparatus, which can be used with lenses of different sizes, can be constructed for £3.

FIRESIDE MUSINGS.

BY W. T. BOVEY.

No. 3.

EDUCATION AND QUACKERY.

NEXT to Fenianism, the question of education has become the sensational topic of the day, and the way to set about the serious task of reformation is a problematical nut that the teeth of no statesman have as yet succeeded in cracking; although, judging from the startling predictions that seem to be borne on the wings of every passing blast, the position is critical, and the quicker the kernel is withdrawn from its hiding-place the sooner will the fears of trembling Albion be dispersed. Why did that fussy French Exhibition so ruthlessly tear asunder the veil that concealed from the eye of egotism the near approach of the "tortoise"? Why has it so unceremoniously dispatched the grey-bearded notion that education for the masses were broad-swords, barricades, and revolution concealed in sheep's-clothing? Above all, why have our Continental neighbours so conclusively shown that popular instruction yields new vigour to skill, strengthens the arm of state, and extends, whilst improving, the several fields of human industry? To those who have enjoyed the advantages of superior tuition it doubtless appears a mystery that England's boast, a cheap press, which, with untiring energy, continues to send forth daily newspapers, weekly journals, and monthly periodicals by tens of thousands; that creates mountains of volumes on every conceivable subject, and consumes as much paper annually as would carpet a continent, should, in spite of its Herculean efforts, have failed in making headway against the stream of ignorance. But to the laborious few whose secret yet resistless impulses have enabled some of the formidable difficulties that accompany efforts at self-culture to be surmounted, the problem is one that admits of ready solution. For, startling as the statement may to some appear, the greatest clog on the mental labours of those "who consume the midnight oil" is a lack of teachers. True, of a certain class, they have preceptors whose name is legion, but how few among them who are qualified to occupy the important positions they assume! How limited the number who strive more to smooth the path of knowledge than to create "mountains out of mole hills," that their own superiority, magnified, might hurl a shaft of timid awe into the breast of the plodding student! Ho! for teachers whose hearts are large enough to hold the spirit of philanthropy, whose armour of modesty and common sense is sufficiently stout to enable its wearers to do battle with those hydra-headed monsters, pre-

tention and ignorance; and who are honestly bent on adopting as their motto and guide, *No quackery; genuine instruction. Not self-buffing and self-glorification.* We want teachers who can make straight the barbarous and crooked jargon that mystify the laws we are, under pains and penalties (held in *terrorum*), bound to obey. Teachers who can set their backs against a nauseating nomenclature, and impart to the outside world a clearer knowledge of that wondrously wrought creature man; and sounder information concerning the pills, potions, and bitter draughts administered to him in his hour of suffering. Teachers who trample under foot the veil of quackery that conceals from the million their Maker reflected in every flower, His power displayed in every blade of grass. Teachers who, in the words of Sir John Herschell, can boldly declare "that everything which, to keep up an appearance of superiority in its professors over the rest of mankind, assumes an unnecessary guise of profundity and obscurity, should be sacrificed without mercy." Teachers who are not afraid to attack the stronghold of scientific humbug by scattering to the winds those ponderous, long-winded words and mystified sentences that mean just nothing; and so lay bare the truth in all its nakedness, that knowledge, at its best, is very ignorant indeed. Teachers who are not for ever thrusting their pupils over the fathomless precipices of metaphysics and false logic. Finally, as a turning-point to our musings, we ask teachers of art principles, for the sake of British photographers who, lacking such knowledge, have sunk into a slough of despond; for have they not been teachers of their foreign brethren? The public press has driven the nail of conviction, and "a Loudon Photographer" has elenched it home.

Reader, have you not of late felt more than usually inclined to deep thought when sitting at your own fire-side? And have you not poked the fire in wrath as the significant sentence recurred to your mind, "English photographers must kneel" before the superior skill of the foreigner? Of course you have, and your proud English blood has tingled in each vein as you scratched at your locks to give some degree of vent to your vexation. Friend, cease to wonder; the reason why of your discomfiture can be briefly told. You are without art-knowledge, and are afraid to seek it. You have been so lectured at, and scolded at, by quack teachers, that in your innocence you have been led to regard art principles as something akin to alchemy and art-teaching. You can scarcely believe them mortal; nay, in your more nervous moments you are wont to fancy that artists are spiritual essences who breakfast off rosebuds and sup on moon-leaves. Pshaw! whisper! We have seen artists nursing cross babies, and have increased the family consumption by joining the artist papas to a bout of beer and bread and cheese.

If this true statement does not bring your ideas earthwards your case is hopeless indeed. Seriously, you are deficient in art-knowledge, and require teachers, not charlatans. Apart from the occasional crumbs extracted by the over-taxed editors of your journals from an ocean of froth, the lessons on art subjects you have received have in most instances proved indigestible and fruitless. Such frizzings about feelings, the philosophy of æsthetics and arts grandeur! Such whizzings of glowings and raptures! Such stringings of sparkling poetry and metaphysical profundities, and such a bang! bang! bang! of learned quotations to show the amplitude of the teacher's marvellous range of erudition.

The Exhibition, taken as a whole, may be likened unto an effort of pyrotechny that dazzles for awhile, but the last thunder that dismisses the climax makes night more black, and darkness more intolerable. "Poetry"! "feeling"! "mystery"! Fiddlededee; time enough for raptures when the student can finger his instrument. Example: Music and painting are twin sisters. The first seeks sympathy through the medium of the ear; the second, from that swift messenger, the eye, chief guardian of the brain; and both awake sensa-

tions generally recognized as emotions or feelings. Admitted! Well, place a flute into the unpractised hands of a novice (one who scarcely knows which end of the instrument is intended to be blown into), and, in the most eloquent and flowery language you have at command, bid him produce music that will draw angels down to listen. Describe to him the glories concentrated in sound, and request that he will endeavour to imitate the heaven-born harmonies of Handel. Speak to him of the wondrous "Messiah," the wonderful "Creation," the sublime thunders of the great Hallelujah Chorus, and when you have puzzled your pupil, and glorified yourself to your heart's content, place before his bewildered gaze the music of some grand oratorio, and bid him play on.

"Squeak—pshew—foo-foo-foo-oo-ooo-o." "Pearls thrown to a certain animal." You would perhaps feel disposed to exclaim, Stop! The two the pupil is the most rational. He did what he could, modestly, and failed. The preceptor, in his anxiety to polish his own person, lost sight of the fact that, in addressing his sublimities to a learner he succeeded only in making himself ridiculous. The pupil needed teachings that would lead him by gently progressive steps from the A B C of notation, through the difficulties attached to "time," up to a complete acquaintance with his instrument, and the grand science of harmony, leaving feelings to develop themselves at their own good time and pleasure. Sound tuition might impart a perfect knowledge of mechanical music, but all the preachings and teachings of the universe could not create an emotion in a torpid soul. Feelings are inborn, and are but echoes to sensations that vibrate within the more mysterious recesses of the brain. They are the spiritual telegraph wires that connect mortals with heaven. As with music, so with art; the student must climb progressively, beginning at its A B C, and following the track until he obtains a perfect knowledge of principles, and confidence in submitting them to practical duties; then, if there is any feeling in him, it must out. Photographers are far in advance of our model flute blower. They can do something better than a "squeak;" but in too many instances we are wont to produce "discord" through having to play by "rote." Our ears require training, and we need a skilful hand to guide our studies. Our impression is, that progressive lessons would prove effectual; and we feel convinced that art knowledge bereft of its mystic mantle of jargon would assume a very attractive shape indeed. So much so, that the time would be nigh at hand when it would no longer with justice be said, English photographers must kneel before the superiority of foreign skill. Oh, then, for a large hearted art teacher! N.B.—No quack professor need apply.

PRICES OF PHOTOGRAPHS IN AMERICA.

AMONGST our trans-Atlantic brethren, as in this country, a feeling has long been prevailing that over-competition and low prices are tending to destroy portraiture as a profession. In New Orleans a meeting of photographers has been held, at which a step in imitation of trades-unionism has been attempted. According to our esteemed Philadelphia contemporary, it was unanimously agreed to advance the prices of photographs, as it had been ascertained that at the low rate we have been charging it is impossible to give good work and live thereby. The resolution on the subject runs as follows:—Therefore, it is mutually agreed that we will, from and after November 1, 1867, charge the following rates as per schedule below, binding ourselves not to deviate from the same under the penalty of being dishonoured and forfeiting the confidence and esteem of the fraternity. In future our aim shall be to excel and advance our beautiful art, instead of, as heretofore, cutting down prices and giving poor work. All lovers of the fine arts will sustain us, and we ask the public generally to encourage us in our laudable efforts:

Schedule of Prices for First-class Galleries.

Cards, original, per dozen .	\$5 00
" " " half dozen .	4 00
" duplicate, per dozen .	4 00
" " " half dozen .	3 00
Whole-plate, original, each .	5 00
" duplicate, each .	2 00
11 x 14 plate, original, each .	10 00
" " duplicate, each .	4 00

Schedule of Prices for Second-class Galleries.

Cards, original, per dozen .	\$4 00
" " " half dozen .	3 00
" duplicate, per dozen .	3 00
" " " half dozen .	2 50
Whole-plate, original, each .	4 00
" duplicate, each .	1 50
11 x 14 plate, original, each .	9 00
" " duplicate, each .	3 00

Signed by all New Orleans photographers.

The dollar is, as our readers know, equal to four shillings and sixpence; we do not enter into the question of the rate of exchange or the relative value of gold and greenbacks. A correspondent of the same Journal remarks:—"I believe there are many who grumble at low prices, who have no right to work a camera at all, and who would do better to first take your Journal and study it and the examples in it, and make their work *worthy* of a good price before they complain. It is my experience that the better work I do the more I can ask for it. If my fellow artists will strive to improve their work, good prices will surely follow, and only those who do badly will have cause to complain."

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 3.

HOLDERS may contain a series of circles, the number being according to their length. Take a piece of wood, planed up, of the length, breadth, and thickness required; make a pencil line right along its centre; on this line mark off a space of half an inch from one end, then the width required for the diameter of the picture, then another space of half an inch, and repeat until the proposed number of circles and spaces are registered, taking care to have an half-inch space at each end. Having set your circular gauge to the semi-diameter of the circle required, thrust the bradawl point into the long line at the proper place, mark out the circles, cut out the spaces with the keyhole saw, then, having marked off two pieces of veneer on the same plan, proceed to finish the back and front, making the same allowance for the rebate as for a single circle. Oval openings would look well for portraits, and be a novelty. The picture need not be cut to that shape, as the receptacle behind may be square. There is one more holder that is easily made; it is merely an oblong frame, having a groove round its inside face to receive the picture. The groove may be formed by a wide saw cut, or by cutting its sides with a cutting gauge and then taking out the centre strip by a small chisel; this is best done in one long piece before attempting to put the frame together; one side of the groove must be thin, that the picture may be placed as near as possible to the condenser. The proportions of the frame are governed by the size of the lantern and the picture to be fixed in it; its principle is like that of a boy's slate frame, and the corners may be put together after that plan. There are also the double-action, rotating holder for chromatropes, the single-action ditto for showing smoke, moving clouds, mill sails, &c., with brass rack-and-pinion action, but can be made of wood on the principle of cord and pulley. To make these would require a skilled mechanic, well versed in the use of the lathe, and hard and well-seasoned wood. Lastly, there is the lever slide holder, with rim and handle of brass.

Now supposing that the transparencies have been made of proper size, clear, bright, and without blemish, and the holders ready to receive them, we will proceed to prepare to colour them. For this purpose I will describe the proper instruments and colours, and how to use them. The glass easel, as being the *sine qua non*, I will speak of first. To make it, hinge together two frames about fourteen inches square, one inch and a half wide, and half an inch thick; now consider its hinged side the bottom side. Hinge also two supports same width and thickness as the frame, six inches long, one to each of the two sides of one frame on its face, so that when it is raised at the end opposite the hinges the supports will rest upon the lower one; cut a rack in that, to prevent the supports slipping, place a piece of glass of sufficient size to cover the frame before it, and the easel is made.

It is, however, as well to add a movable bar in its front, for the purpose of raising or lowering the glass as required; therefore bore a row of holes along the centre of the two side fronts of the frame to be raised by the supports, opposite each other, make a slight bar of wood of sufficient length to reach across the frame, having a hole at each end so bored as to come opposite to the poles on each side the frame; now, having two brass pins, place the bar across the frame at such a height as may be convenient, thrust them through the holes of the bar and into corresponding holes in the sides of the frame, and fix the bar tightly on; rest your plate of glass in it, and against the frame, having first raised it to a convenient angle for painting upon. The next requisites are a glass slab and muller (its face to be unground); a sheet of white paper; a clean rag; a few small, clean, dry glass bottles with corks; some camel-hair or sable pencils of various sizes, fixed on sticks; a small T square (which will be more useful provided it has a bevel, working on the crosspiece by a screw in a collar); a pen-knife having a lancet-shaped point; a small palette-knife; a few pieces of glass one-sixth size; a small straightedge, to rule lines by; a mahl stick (which is only a light stick or cane of sufficient strength to rest the arm upon, to steady the hand whilst painting); also a dabber or two, made thus,—cut out a piece of an old kid glove where there are no stitches, put sufficient cotton-wool into to make it look (when tied up) like a ball, about as big as a boy's marble, having a little handle, or perhaps more like an artist's bladder of oil colour; a paper stump, a few common sewing needles of various sizes, fixed in small handles—broken ones will do—using the pointed ends to work with on your painting. If circles are to be painted, an oblong holder should be made of mahogany about one-eighth of an inch thick by an inch and a quarter wide; its extreme length may be seven inches and a half and five inches and a quarter in width; its outer angles must be truly square; the inside measure will be five inches by two inches and three-quarters. Now cut away the sides of the inside space equally, so that they may form a diagonal one of four inches by two inches and three-quarters, the bottom and top remaining uncut. Supposing it finished, place it flat on the table, place a circle in the larger end, push it smartly towards the lesser end; now raise up the whole together, and you will find that it can be handled in any way without danger of the circle falling out. With the T square placed on its outer edge, as required, upright or horizontal lines can be drawn with the greatest truth at any part of the circle; and with a bevel, diagonal lines also. The size of the holder as now given is intended for circles about three inches and a half diameter; for larger or smaller ones, the inside dimensions must be altered accordingly.

114, High Street, Ilfracombe, North Devon.

ERRATA IN No. 2.—For "muller and tone" read "muller on his paintstone," line 22, paragraph 3; for "screw" read "screen," line 7 from top, right hand column; for "three-fifths" read "three-eighths," line 12, 2nd paragraph, right hand column; for "keyhole-frame saw" read "keyhole or frame saw," line 32, 2nd paragraph, right hand column; the word "under" misplaced, read "and only

under," line 5, page 608. In a few copies of the News a printer's accident misplaced some letters, which will not lead the reader into error.

STEREOSCOPIC MICRO-PHOTOGRAPHY.

THE QUEKETT MICROSCOPICAL CLUB, the successful progress of which we have recorded from time to time, has just issued the first number of a Quarterly Journal of its proceedings, under the editorship of Mr. Hislop. Amongst other interesting papers we find some good remarks on microscopic photography, and on the illusionary effect of relief, at times produced in viewing flat surfaces in the stereoscope. The writer remarks:—

"Every one who has dabbled in photography, and at the same time possesses a microscope, must at some time or other have been impressed with the extreme suitability of the process for producing precisely what was wanted in the delineation of minute objects. Pictures can be produced by this process so extremely minute in detail as absolutely to require a hard surface and the use of a magnifying power to bring them out properly. Many have experimented in this direction, but foremost amongst them all must be reckoned Dr. Maddox, whose exquisite photographs of microscopic objects have far surpassed anything that has been published in Europe. Dr. Maddox favoured us with a visit at one of our recent meetings, and exhibited there some of his latest productions, which were most admirable, both in pictorial effect and faithful representation. Some of these pictures were of the markings on diatoms, such as *Pleurosigma Formosum* and *P. Angulatum* magnified 3,000 diameters, and were exhibited as tending to solve the question as to whether they are in relief or not. For this purpose Dr. Maddox views them stereoscopically, when most certainly this effect of relief is produced. Some stereo-photographs of *Pleurosigma Formosum* exhibited by him, when placed under the stereoscope, showed the dots as hemispheres standing in closer proximity to the eye than the surface of the frustule upon which they appeared to be set; in fact, presenting the appearance of so many minute ivory balls. Attention was also drawn to the fact that some of the diatomaceous discs, when viewed stereoscopically, are seen to be composed of two surfaces, an outer and an inner one, with a certain amount of structure between them. Mr. Bockett drew attention to an experiment of Mr. Beck's, in which that gentleman photographed a portion of a glass tumbler, on which the pattern was produced by hemispherical protuberances 'like so many plano-convex lenses on a convex surface,' in which photographs there was a tendency to exhibit those hemispheres as hexagons, according as their tops or bases were focussed by the lens.

"We very much fear, however, that the stereoscopic test is hardly reliable. Very considerable apparent modifications of form are produced by varying the condition of binocular vision. Apart from the fact that if you change the pictures from one side to the other you will find the relief become depression, and *vice versa*, it will be observed that if a perfectly flat picture be examined by a pair of short focussed stereoscopic lenses, it will appear to stand up precisely like the field of a binocular microscope. Take a negative of a black disc, for instance, and print two copies of it either on glass or paper, place the two side by side in a stereoscope, and, although pictures of a flat surface, the effect will be that of a convex one.

"Apart from these considerations altogether, there can be no doubt that Dr. Maddox deserves well of the scientific world for his arduous labours in delineating minute forms. Many of his beautiful productions may yet be seen at Mr. How's, Foster Lane, Cheapside, although we very much regret to say that, considered commercially, they have not met with the success which they merit. More than this, after seven years' labour in one direction, this zealous worker finds his sight is injured, and, for want of the successful publication of his works, is compelled to give up the further

pursuit of his experiments, without having realised that pecuniary reward which his unwearied efforts so eminently deserve."

LECTURES ON ART.

THE Cantor lectures on art recently delivered before the Society of Arts by Mr. R. Westmacott, R.A., F.R.S., although referring especially to sculpture, contain much of interest and instruction for all art students. We append an abstract of some portions, condensed from the Journal of the Society.

In the first lecture, after expressing the pleasure it afforded him to accept the invitation of the Council, and some comments on the want of general education in art, he remarked that the fallacy of the opinion that any one unacquainted with the true principles of art can be a competent judge of works of art was gradually gaining ground. It was admitted that to judge of the merits and value of any of the ordinary products of industry required some education in the particular branch of science or skill to which the object belonged; but in the matter of art every one thought himself capable of forming a correct judgment. It appeared to be the opinion of some that if a picture or statue afforded pleasure to or satisfied its admirer, and possessed qualities that hit his peculiar liking or fancy, such a work was to him a work of beauty and merit. There could not be a greater mistake. It was a distinct question. It was one of liking, not of merit or beauty. A vulgar, commonplace work of art could not be other than vulgar, however and by whomsoever it might be admired or preferred. But knowledge added to enjoyment. For instance, a musical work might be performed in a mixed company, and nearly all would listen to it with a certain amount of pleasure; but how much greater would be the gratification, and how much higher the enjoyment, to educated musicians, who could not only listen to the melody, but enter into the train of thought, and appreciate the power of combination, evidenced by the composer, in producing a work of character, expression, and beauty. If this were true of music it must be equally true of painting or sculpture; for what words and rhythm were to the poet, and sounds to the musician, colour and lines were to the painter, and form to the sculptor. To attain to anything like a just appreciation of art required education; and none but true artists (he meant those who really understood the true principles of art), whether professional or amateur, could be considered as trustworthy judges and guides in matters of art; for it was not sufficient that the object should afford pleasure to constitute it beautiful or worthy. This was illustrated by the affection of a mother for her child, which was utterly irrespective of its beauty. No one could look around him and see the multitude of miserable little objects, which were so naturally the objects of affection to their parents, and say that, because they were loved (or, as in art, liked and admired), the poor, afflicted children were therefore beautiful. It was not only the deficiency of art education in this country, but the want of efficient encouragement for the production of high and noble works of art, that was to be regretted. Artists in England did not seem to aspire to anything heroic and noble in their works, as did those of Greece and the great artists of Italy in times past, but they appeared rather to work down to the present low standard of public taste. In England how few works showing really high aspirations were to be met with among the thousands of pictures produced every year. This, doubtless, was in a great measure due to their non-appreciation by the public when produced. In Greece and Italy the reverse was the case. The people had the natural sensibility which made them capable of appreciating the noble, the beautiful, and the heroic in conception; and the artists of those countries were obliged to work up to the standard of public knowledge and public taste; and the result was the great works which happily had been preserved, not only for our instruction and study, but also for the delight of cultivated minds through all ages. The lecturer adverted to a feeling some persons entertained that we had no subjects calculated, like the myths and poetry of the Greeks, to afford opportunities for high and beautiful art. This he denied, and spoke of the splendid sources of inspiration to be found in the Bible, both in the Old and New Testaments; grander, he thought, than anything in the mythologies of ancient Greece and Rome; and he hoped that as the public taste improved, these subjects would become more and more studied by the higher class of artists. One

advantage to be derived from education in the principles of art would be to enable people to judge for themselves, and to free them from the dictation of self-elected critics, too often very incompetent to act as guides of public taste. They would then not feel bound to believe a thing to be good or bad simply because they had seen it so stated in print; but, having knowledge themselves, they would understand the true principles upon which to judge the works produced. He was glad that the wish to possess such knowledge appeared to be a growing desire on the part of the public, and he hoped to assist those who favoured him with their presence to attain a knowledge of why some of the works of the great masters, particularly in sculpture, were truly beautiful, and worthy of the admiration that had been so universally accorded to them.

(To be continued.)

Correspondence.

INDIA-RUBBER FOR MOUNTING.

SIR,—I have been much surprised at the recent fuss made in some of the journals on the subject of mounting photographic prints with india-rubber. In your article last week you rightly state that its use for mounting is no novelty; it has been used for many years, and if it had possessed any advantages for general purposes would long since have come into use. But the fact that, besides being very expensive, it eventually perishes, is tolerably well-known amongst old photographers. I have seen albums in which the prints, having been mounted by india-rubber, became all detached in a few years, the adhesive gum have changed into a dry, brown powder which crumbled under the finger.

The best material I know for mounting prints on thin boards, without cockling, is glue, used with as little water as possible, and very hot. I always test glue for acidity before using it.—Yours, truly,
AN OLD HAND.

December 20, 1867.

MAKING A BELLOWS CAMERA.

SIR,—In answer to "W. L. R.'s" (Raepore) inquiry respecting the making of a bellows to a camera, let him make a hollow tube of some thin boards, just nailed together, the width, depth, and length he requires the bellows, procure some twill calico, sew it up the edge on the tube, take the calico off again, and reverse as you would a coat-sleeve, and place on the tube again with the seam underneath the calico; cut some strips of card-board, half or three-quarter inch, according to size of bellows, and a little shorter than the sides of the tube across, with the corners cut slantways, so as to make each piece a section of a pyramid. Then glue them on the calico which is on the tube, alternately, as you see the points in a bellows. I find it better to put one slip on at a time all round the tube than fill one side and turn round to another. When filled the whole length, either paste or glue another piece of calico over the slips and other calico; when dry, take off the tube, and, with the assistance of his fingers at the corners, he will find the bellows to fold up quite easy, as required.

The first bellows I made I did without the box or tube to make it; but I find it much easier with it. I do not send this as the proper method, but as a way that will answer in practice.

If you think the above of any service, insert what you think suitable; if not, give it to the printer's d— to light the fire.—I am, sir, one who is always willing to contribute his mite,
A COUNTRY BUMPKIN.

Macclesfield, December 18, 1867.

Talk in the Studio.

PHOTOGRAPHY AND BRIGANDAGE.—A comic opera recently introduced to the public, the libretto of which is written by

Mr. F. C. Burnand, revives the recollections of the seizure of Mr. Moens by the brigands. "The Contrabandista"—the name of the piece—represents the doings of a set of ferocious Spanish brigands who have just lost their leader, and, in accordance with one of their laws, the stranger who crosses their path must be elected captain, and marry the late captain's widow. A luckless photographer, wandering in search of the picturesque, falls in with the brigands, and, to his horror, is required to give up the camera for the carbine, and his lenses for a lady. Much of the humour of the piece arises out of these incidents. The piece is performed at the new "St. George's Opera House," Langham Place, under the superintendence of Mr. German Reed.

PHOTOGRAPHS IN AN EXHIBITION OF PAINTINGS.—The hedge of exclusion which has hitherto prevented the recognition of photography as works of art appears to be breaking down. In the Exhibition of the works of female artists, which will open shortly, we understand that a large number of Mrs. Cameron's photographs will be comprised.

CYANIDE AGAIN.—A lady poisoned herself in New York, a short time ago, by taking a dose of cyanide of potassium in mistake for rhubarb. A physician was sent for, but before he arrived she died.—*Philadelphia Photographer.*

A photographic amateur had occasion to use cyanide, and made a solution in the mug used in his bath-room, and out of which it was the custom of his children to go and drink when thirsty. Forgetting it, he left it standing full of the colourless poison, returning just in time to prevent his child from drinking it. Will people ever learn to be careful?—*Ibid.*

STILL ANOTHER APPLICATION.—A subscriber, who is also the leader of the choir in his church, needing duplicate copies of a certain hymn and the inside, soon produced them by aid of his camera, and sends us a proof quite as good as the original. A first-rate idea. What next?—*Ibid.*

ANOTHER CAUSE OF SPOTS IN PRINTS.—Photographers are not unfrequently troubled with black and yellow spots appearing in card pictures which were not apparent before. The following cause is assigned by Mr. Fordos, and confirmed by M. Davanne: Sulphuret of tin is employed frequently in applying gilding to the cards, and particles of this left on the surface of the mount, on coming into contact with the print, will cause spots of sulphide of silver.

LECTURES ON LIGHT.—The "Science of the Sunbeam" was the title of a very able lecture recently delivered by Mr. Jabez Hughes, before the Isle of Wight Philosophical Society, which was illustrated by photographic experiments. We regret that we have not space at present for some eloquent passages we had marked. A lecture on a similar subject was delivered a few evenings ago before the Church of England Christian Young Men's Association, by Mr. George Warrington.

PHOTOGRAPHIC CONUNDRUMS.—We have received the following photographic conundrums as being, we presume, suited for a festive season. No correspondent's name accompanies them, but the writer has appended the phrase, "made by our own idiot out of his own head." Of the idiotry we leave our readers to judge, but we disclaim the ownership:—"What photograph should a young lady never give her intended?—A negative. But if he gets a negative, what should he do?—Take a little sigh an' hide (cyanide). What photographic prints are like the heir apparent?—The Prints of Wales. When is a collector of customs like a photographer?—When he takes port-rates. Why should a photographer use a rolling-press?—To make his portraits flatter. What chemical is like a concealed donkey?—An ass hid. The photographic pirates; what is their little game?—Cribbage. At whist, how do hope to win?—By tricks, and not by honours. What are their winning cards?—Knives. When is their little game up?—When somebody plays the deuce with them."

To Correspondents.

MIS.—In arranging blinds in such a room as that of which you send diagram, we should make those for the skylight slide with rings from side to side, so that you could have any lateral portion you choose covered or uncovered. We should make the blinds for side-light to slide in like manner, always, however,

sliding from front to back; a cord running through the rings attached to each, and hanging down from the higher end, to be either attached to a hook to hold the blinds in position and prevent them sliding down the rod, which, of course, must be on an incline, or to be furnished with a counterpoise weight for the same purpose.

CAMERA.—"The Photographer" is an amateur magazine, as we described in our last, and is only circulated amongst the contributors and their friends. Anything of interest it may contain will be published in our pages.

W. BARTHOLOMEW.—Of course the character of the sitter materially affects the possibility of producing pleasing portraits; and the more graceful, striking, or beautiful the model the better will be the picture. The more plastic the model the more easily will the capable artist produce good results; and the more awkward and intractable, the greater will be his difficulty. The more skill and knowledge a photographer possesses the more control he will have even over ungainly and intractable sitters. We have seen many of M. Salomon's portraits of Englishmen, all very excellent pictures. Two of the five gentlemen's portraits we exhibited at Conduit Street were Englishmen. We shall be glad to hear more of the idea to which you allude.

WATERLOO.—We are glad to learn that you have found the partial obscuring of your top-light by stippling with white paint produce such a marked improvement in your pictures.

NON-CHEMICS.—A combination of oxide of gold and ammonia forms fulminating gold, which is highly explosive and dangerous. Whether any trace of this may have been formed in precipitating your old toning baths with ammonia-sulphate of iron is difficult to say. You may obviate all risk by avoiding drying by heat. A trace of moisture left in the black precipitate will not be a disadvantage in making it into chloride of gold by means of nitro-hydrochloric acid. You will only need to add a little less water with the mixed acids.

THOMAS STOTHARD.—The addition of gelatine or of iodine to the developer will not prevent the over-action of light in a window directly opposite your lens in a dark interior. If you cannot cover the window for a time during the exposure, the best remedy will be to paint the back of the plate with red paint, or press a piece of damp red blotting-paper at the back. This will prevent the spreading of the light over the edges of the window. 2. In crystallizing after evaporating by heat, set the solution in a state of super-saturation in a cool place to crystallize; then pick out the largest crystals as they are formed, and repeat the process.

AN OLD SUBSCRIBER.—Pure gelatine (Nelson's, for instance) is nearly free from colour, and, in thin layers like varnish, or in tolerably thin solutions, it is practically colourless; but when you speak of a sample "perfectly colourless," we cannot say that we have ever seen such a sample. 2. Chrome alum you can best obtain by writing to Mr. Swan, Mosley Street, Newcastle-on-Tyne. The exceedingly minute trace of it used to render gelatine insoluble renders the colour inappreciable. Common alum, or sulphate of alumina, will render gelatine insoluble.

X. Y. Z.—Enlargements by the enlarged negative process can be obtained as sharp as enlargements by the solar camera. 2. Various fluxes may be used with chloride of silver. Mr. Hart's plan of adding half the weight of powdered resin and a little borax is good. That most commonly used is a mixture of the carbonates of soda and potash, twice the weight of this being added to the chloride of silver. It is not very important that every particle of filtering-paper should be picked out. 3. There is no method of saving the gold better than that described by Mr. England, which you will find in our YEAR-BOOK for 1867. It consists in precipitating with sulphate of iron, and boiling the precipitate with nitric acid.

KENT.—It is well, for keeping purposes, to preserve your albumized paper quite dry; but the stock for immediate use may be kept in a dampish place, as over-dessication is attended by many troubles. 2. Waxing prints should be effected after mounting. The wax should be used in a state of thick paste made with an essential oil, such as that of lavender or rosemary. It is roughly applied in places over the print, and then rapidly spread by means of friction with a clean piece of woollen cloth. It is not necessary to have a perceptible coating of it on the face of the print; but if you leave half a print undone, you will quickly perceive the additional richness in the shadows of the part treated. An enamel or encaustic paste for the purpose is prepared by some houses. Newman's have a very good article. 3. In excess of water, chloride of silver is apt to remain suspended a long time. Use as little water as possible, and now and then add a little hydrochloric acid, as chloride of silver is partially soluble in solutions of alkaline chlorides. 4. The decomposition which you describe in the gelatino-iron developer is due to lack of acid, or, possibly, to the use of an impure sample of acetic acid. See Mr. Spiller's article in our YEAR-BOOK in reference to testing acetic acid. Thanks.

W. F.—Your phrase, an "illuminated photograph," is scarcely sufficiently definite to enable us to advise you, and your account of the purpose for which it is intended is not sufficiently clear. An illuminated photograph may either consist of positive transparency on glass, or of a positive on paper, made transparent by wax or varnish, and brilliantly coloured. We should fancy you want the latter. 2. The question as to enlarging must depend on the size of the negative and of the print required. 3. In any case, if used by artificial light, it should be placed facing the gas, and be screened a little from light on the side at which it is examined.

W. J. A. G.—Hyposulphite will keep in solution before it has been used; but when once it has been used for fixing prints it is liable to change, and should not be used afterwards. 2. You can take open-air groups with your Ross's single lens; it will give you perfectly good and sharp results. For interiors, all single lenses will, however, give curved lines; a double or triple combination is necessary. 3. For interiors or architecture we should prefer No. 2; for landscape and general purposes No. 3 would be better. 4. We prefer a bellows camera. 5. In making or renewing the acetate of soda and gold toning bath no carbonate of soda should be added. 6. Both the samples of cloth are poor, thin, and open. It is possible to get both the twill and the yellow calico closer and better, so that a thickness of each would be opaque enough for a tent. If these are of the ordinary width (that is, three-quarters of a yard wide), they are worth, perhaps, half the price you quote. 7. As a rule, less acid is required in a strong iron developer, because its action being less prolonged, less restraining agency is necessary. If it were necessary to force development by prolonged action of a strong developer, then it would require more acid in proportion to its strength.

M. G.—A little thought will satisfy you that when you are using an artificial light to illuminate any single object you waste a large quantity of light, unless you use a reflector, as the light radiates in all directions, only a small portion falling on the object. By using a suitable reflector you concentrate the chief part of the light on the object to be illuminated. To succeed satisfactorily with the magnesium wire you undoubtedly should use some kind of reflector.

G. G. G.—The changes which take place in the production of a print by the oxy-hydrogen light are the same as those which take place in the same operation by sunlight. When iodized paper is brought into contact with the bath of nitrate of silver, a process called double decomposition takes place, and iodide of silver is formed in and on the surface of the paper. The action of light upon this sensitive paper is to set up incipient reduction of the iodide of silver, which reduction is completed, in the ratio in which light has acted and commenced it, by the gallic acid, which is in itself a reducing agent, or an agent tending to reduce salts of silver to their metallic form. The object of immersing the print into the hypo solution is to remove all unchanged iodide of silver, which, being still sensitive to light, would, if not removed, cause the whole of the paper eventually to become darkened. The quantity of hypo necessary to fix a print depends, of course, on the size and upon the quantity of silver salt to be dissolved. Speaking roughly, about two sheets of paper may be fixed with one ounce of hyposulphite of soda in five ounces of water. The time of immersion depends somewhat on whether the paper be thick or thin, and the weather cold or hot; but from ten to twenty minutes will generally suffice.

W. P.—The diagram E indicates the saucer containing chloride of calcium. Gutta-percha grooves might do, but if much heat were applied they would soften and lose form. Plates should be well drained before placing in a drying box. Thanks.

JAMES ANDREWS.—The mistake is doubtless a very troublesome one. The only thing you can do is to get it rectified as early as you can, and avoid using as far as possible the incorrect cards.

A DABBLER IN THE ART.—We published all the particulars of the Chassis-Cuvette in our possession. It is not, that we are aware of, made or sold in this country.

G. M. (Amsterdam)—The firm you mention sells colour for colouring transparencies, and the work contains hints for colouring glass positives. We do not consider the second work you name trustworthy, especially on the point in question. 2. So far as evidence reaches us, the second you name is as good as the first. Yes; we think so.

Received, "Loaf Prints, by C. F. Himes, Ph.D."

Some Articles and Critical Notices are compelled to stand over until our next.

Several Correspondents in our next.

* * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
A Few More Words on India-rubber for Mounting and Transfers	13
The Use of a Second Studio	14
Preservation of Paste, Glue, etc., for Mounting	14
A Novel Hint for Double Printing	14
The Old Toning Bath of Hyposulphite of Soda and Gold	14
Leaf Prints by Photography	15
Critical Notices	16
Another New Dry Process—Soap in Collodio-Bromide of Silver	17
Against the Use of Distilled Water for Photographic Purposes.	18
By Nelson K. Cherrill	18
Recent Experiments with Collodion	18

	PAGE
Artistic Pictures Photographically Considered. By E. Dunmore	19
Resuscitation of the Old Toning and Fixing Solution. By Prof. John Towler, M.D.	21
Studio Hints. By a Practical Man	22
Proceedings of Societies—North London Photographic Association	23
Correspondence—Carbon Printing—Sugar in the Printing Bath.	23
India-Rubber Mounting—Explanation	23
Talk in the Studio	23
To Correspondents	24

A FEW MORE WORDS ON INDIA-RUBBER FOR MOUNTING AND TRANSFERS.

SOME further experiments with india-rubber for mounting, and some communications on the subject, suggest a few further hints of importance.

In the first place, on the india-rubber. We find that the solutions formed by various samples of india-rubber differ considerably; some give a solution which always remains semi-opaque and turbid looking; others, no matter how dilute, the solution always retains a dark brown colour. The best result we have obtained was from a piece of india-rubber we received from Mr. Woodbury, which had been purchased, we understood, in Paris. It is apparently prepared expressly for the purpose of solution, being useless for any other purpose in the shape it is kept. It is termed *macerated* india-rubber, and is, in the rough sheet, almost like a piece of coarse woollen frieze. It dissolves somewhat slowly, and a flocculent insoluble deposit is left. After standing, however, to settle, the solution is very clear and light-coloured, a ten-grain solution being of a straw colour, a twenty-grain solution of a deep amber colour. We find that, cut into shreds and just covered with essential oil of rosemary, about a drachm to twenty grains of the india-rubber, a pasty mass is formed, which is readily dissolved on the addition of benzole or highly rectified naphtha. After shaking at intervals for a few hours, the solution should be left to stand to settle, and in twenty-four hours it is perfectly clear. The mixed odour of the benzole and rosemary is far from unpleasant, and the latter, being the most persistent, overpowers the other, and remains longer than the other.

With some samples a twelve-grain of india-rubber solution will be found apparently sufficiently adhesive; but we do not recommend for use a solution containing less than twenty grains to the ounce. Some prints mounted with the twelve-grain solution, in which the surfaces seemed to cohere perfectly, curled up at the edges after lying a few hours in a warm room, and it was found very easy to separate the print from mould. With a twenty-grain solution the cohesion is more perfect; but the attachment is never so firm as with paste or glue. To secure the best adhesion with india-rubber both surfaces should possess a very definite film or varnish of the gum. We have seen it stated that the print and mount, after having been coated and dried, present no change in appearance. This is the case when a very dilute solution is evenly applied, and it is possible to secure some degree of cohesion with such a film, but the attachment is very slight, and easily destroyed. We strongly recommend, therefore, the use of a solution of not less than twenty grains to the ounce; and this should be freely flowed over the surface, not spread as thickly as possible. A thin solution has, in some cases, the defect of sinking into absorbent paper, and produces a mottled appearance.

It is comparatively useless for any one to attempt mounting with india-rubber who has not a rolling-press. Although the cohesion of the two surfaces of india-rubber may be secured by rubbing the print well down, the effect is very unsatisfactory and unfinished-looking. When paste or a similar material is used, the paper becomes softened, and by the contraction in drying, a smooth even surface is secured. When india-rubber solution is used no such result is obtained; the print is not softened, but retains its harshness, nor is there any contraction; the consequence is that any crease, crack, or slight rumpling which may be in the unmounted print shows very definitely in the mounted print, unless by heavy pressure in rolling it is removed. The rolling is, therefore, imperative to secure even a tolerable appearance as well as perfect cohesion.*

The stability of india-rubber as a mounting material must still, however, be considered doubtful. Dr. Diamond recently called our attention to an album in which photographic prints had been mounted with india-rubber a good many years ago, and which had recently been examined since the idea was revived of using this material. A large number of the prints had become entirely detached and were loose in the book, the adhesive quality of the india-rubber being entirely gone, a dark brown powdery resinous substance remaining on the mounts. In some cases, where a thin solution had been used and had permeated the print, its surface was mottled with irregular brown stains. The prints mounted with india-rubber appeared in no respect more stable than others produced at the same time and mounted with other materials.

A correspondent mentions a recent recommendation, in a contemporary, to use the india-rubber solution as a transferring agent for collodion films, and asks if it can be used with advantage in the simple method of enlargement we recently described as a means of transferring the enlargement transparent positive to paper. India-rubber would have, we fear, a serious defect for any transferring process. The fact which we have mentioned, that it darkens under the action of light and eventually changes into a resinous substance without cohesion, would be fatal to its utility. Few samples are, even at the outset, so perfectly colourless as not to degrade the purity of white paper, and the high lights of the transferred enlargement would necessarily suffer. As an aid to lifting the film for temporary purposes, in any case where the qualities to which we have referred would not be important, india-rubber will doubtless be useful; but we cannot recommend it as the permanent support

* Since writing the above we notice a letter in a contemporary recommending, in the absence of a press, rubbing down with the edge of an ivory paper-knife. This is a good suggestion, and is of value with a perfectly smooth unbroken print; but if, from curling in drying, &c., there is any rumpling of the paper, nothing but rolling will give smoothness and evenness to the mounted print which the softening effect of the paste and the contraction in drying gives to prints mounted in the ordinary way.

for either collodion negative or positive, as in either case it must necessarily be exposed to the action of light, which produces discolouration, and facilitates the change which destroys its coherent qualities.

THE USE OF A SECOND STUDIO.

MR. NOTMAN, of Montreal, speaking of the production of pictorial studies by means of photography, recommends all who would excel in this direction to have a second glass-room as a private sanetum for study, in which he may be free from interruption in his special work. Addressing our excellent contemporary, the *Philadelphia Photographer*, he says:—

"One of the greatest luxuries a professional photographer can have, so thinks the writer, is to own a well-lighted sanetum or studio, to which he can retire, and in which he can carry out, without fear of interruption, any fresh ideas which may suggest themselves from time to time. It is not advisable to disturb the studios or rooms in every day use, which, if well appointed, ought not only to be carpeted, but abound in suitable pieces of furniture and choice ornaments, such as are usually seen in drawing or sitting rooms. If possible, let such be real, and so arranged that sitters may have somewhat of a home feeling. The sanetum above referred to need not be carpeted, but be covered with some such stuff as Kamptulicon, which looks so brown and shabby to begin with, that you never fear spoiling it, but as occasion requires, with perfect freedom, pile cordwood on it, build cottages, form sandy beaches with boats drawn up, erect tents, plant trees, crowd solid blocks of ice, form snow-wreathed plains, or, as in the case of the picture for this month, introduce a frozen lake or stream, on which the skater may appear to glide. All this, if it does not afford a change of air, at least gives a change of scenery, and by leading you out of the every-day rut invigorates and refreshes the mind. Do not think that carrying out such ideas involves an outlay of money without any return. In most cases it will be found a very profitable branch to add to any photographic business."

PRESERVATION OF PASTE, GLUE, ETC., FOR MOUNTING.

ONE of the chief dangers to the permanency of a photograph which can arise from the nature of the mounting material is due to the process of decomposition or fermentation incident to such materials by which acid conditions are generated. Starch and flour-paste and solutions of gum readily ferment; gelatine and gum are apt to decompose. But there is an efficient preventive of either form of decomposition, which, although tolerably well known, is rarely made available by photographers. A trace of carbolic acid prevents decomposition in albumen, gelatine, glue, and similar substances, and will also effectually preserve from any tendency to fermentation paste of wheat flour or starch; and it effects this without in any way altering the qualities of the material, or, like corrosive sublimate and similar agents formerly used for preserving paste, introducing anything injurious to the photograph.

If a few drops of a 10-grain solution of carbolic acid be added to paste or glue when prepared for use, no fear of change or putrefaction need be entertained, as it at once destroys the germs upon which fermentation and decomposition depend. If glue be used it should be tested at the outset for acidity, and a little ammonia added if any trace of acid be present. Most samples of glue and gelatine in the market are more or less acid; the only article of the kind which we have reason to believe to be free from acid is a fine sample of glue prepared by a special process by Bevingtons, of Bermondsey, which doubtless might be brought into the market which supplies photographers, if the demand were created for it.

A NOVEL HINT FOR DOUBLE PRINTING.

THE charming card pictures of Mr. Edge, especially those with a natural pictorial background, printed from a separate negative, have given rise to a considerable amount of speculation as to their mode of production, and various ingenious theories have been advanced as to how such effects might be produced. Whether Mr. Edge has some secret method of working, or whether the result is due to the skilful application of known methods, we cannot say. In answer to an inquiry on the subject, Mr. Edge stated that his method could not well be described in writing, but requires to be seen to be properly understood. We published a few weeks ago some excellent suggestions from a correspondent as to the best mode of producing similar effects. We now append a letter from a correspondent in Guernsey, which contains an exceedingly ingenious suggestion for a mode of obtaining accurate masks to aid in double printing wherever delicate and careful joining is required. We will print this letter and then add one or two observations on it.

DEAR SIR,—Do you think that pictures might be produced by the following method, similar to those of Mr. Edge?—

1st. Let the portrait be taken with any suitable foreground, but the background must be very light in colour.

2nd. Let a view be taken from nature, or otherwise, upon a dry plate, and, before developing, print the portrait, foreground, &c., upon it, to such an extent as will form a mask, which will, of course, be of the exact form and shape of both figure and foreground, while the part intended to be used as a background will be protected by the light background of the portrait negative, according to its intensity. It may be necessary to retouch the high lights through which the light has not been able to penetrate. Great care will be required in fitting the paper upon the second negative after having printed from the first.

I have not had the pleasure of seeing any of Mr. Edge's pictures, but from what I have read in the *News* this appears to me to be the best way to do pictures of that description.—Yours faithfully,

N. O. MARQUAND.

Fauvert Street, Guernsey, Dec. 30, 1867.

The hint here given appears to be an admirable suggestion for the production of masks. The most careful scissor-work in following the undulations of a fine outline must at times fail; but here we have a means of printing a mask of the figure on the background negative itself. The dry plate containing a latent image, either of natural scenery taken direct from nature, if convenient, or from a transparency taken from an ordinary landscape negative, or otherwise, as may be desired, is still sensitive to light, and when the portrait negative is superposed upon it and exposed to light it will receive another image. The light background, representing the part to be subsequently filled up with a landscape, is in the portrait negative sufficiently dense to protect that part of landscape from further action of light. When the dry plate is developed the landscape will come out without change where it has been protected from light; but where the figure in the negative has permitted the light to pass through, there will be a dense deposit from the double action of light super-imposing one image on another. Where it is insufficiently dense it will be easy to touch upon it with black paint or black varnish, the great difficulty of getting a perfect outline having been already overcome. A perfect mask so obtained, the manipulations in double printing are then reduced to simple matter of mechanical skill and care.

THE OLD TONING BATH OF HYPOSULPHITE OF SODA AND GOLD.

THE prevalence of faded prints during late years has led to the not unfrequent enquiry, Have we really gained anything in permanency by adopting the alkaline toning system? And there have been some high authorities—Mr.

Heisch amongst the number—who have maintained from the first that theoretically there was nothing in the present system of toning and fixing more conducive to permanency than in the old system, conducted properly. We believe that prints produced by either system, if properly treated, have a fair tenure of permanency; but we believe that the present system is safer, that there is less risk of sulphur-toning and imperfect fixation, than in the bath in which the toning and fixing functions were combined. The fading prints, of late so common, are chiefly due to careless or ignorant treatment in fixing and washing, especially to the repeated use of the same fixing bath after decomposition has commenced.

We are not about to enter into the question in detail, however, now, but simply to call attention to an interesting article by Professor Towler, which we reprint on another page. Our American confrere bespeaks for the old bath of hypo and gold reconsideration, as possessing in some respects undoubted advantage in results over the present method. Alkaline toning processes have the tendency to bleach the prints sometimes in an excessive degree, whereas in a bath of hypo and gold this bleaching process is exercised in a much slighter degree. We wish to suggest to experimentalists who may be disposed to try toning on the old principle, that to be safe the solution should be neutral, and that a subsequent immersion for a short time in strong, fresh solution of hyposulphite is desirable. If freedom from bleaching be the chief advantage desired, that can be perfectly obtained by the use of the toning bath of sulphocyanide and gold, in which no appreciable reduction takes place.

It is to be admitted that the subject of sulphur-toning remains to the present time very imperfectly understood, and that from general experience, rather than from theoretical necessity, it is held in dread. Sulphide of silver is usually of a fine black colour, and very permanent; but the form of it with which photographers are unpleasantly familiar is of an unpleasant yellow, or greenish tint. That this is not necessarily the case we all know: we are familiar with fine black prints, produced many years ago, which remain unchanged now. We have before us at this moment some prints we received from Carl Meinerth, of New Hampshire, U.S., five years ago. They were described as having been toned by immersion for eighteen hours in an old toning bath of hypo and gold made eight months before; and that after fixing they were only washed for one hour. The prints were some of a rich purple, and others a pure neutral black with perfectly pure whites, the prints being vignettes. They were toned just five years ago, and they present no change now: the whites remain pure, and the blacks rich and deep. The permanency seems, indeed, beyond challenge. This is one of many such facts familiar to old photographers, and which render further examination into the causes of such permanency desirable.

LEAF PRINTS BY PHOTOGRAPHY.*

THE sun has been both draughtsman and painter from the time when "the morning stars sang together and all the sons of God shouted for joy;" and "leaf-prints" have been amongst his most favourite works. It was not, however, until the present century that he entered into the service of man to work to order as a draughtsman and printer, and leaf-prints were amongst the earliest specimens of his powers when he entered upon his task under man's guidance. Some of the earliest experiments in securing images on chloride of silver were produced by superposing leaves, lace, and similar objects on the prepared paper, fac-similes of which, in white or a light tint, were obtained on a black ground. Singularly enough, although such a mode of procedure might have many interesting applications, it has received since but slight attention or further development.

* Leaf Prints: or, Glances of Photography, by Charles F. Himes, Ph. D. (Philadelphia Bennerman and Wilson).

Professor Himes, in a handsome little volume, introduces this mode of working to the public as a valuable aid in the study of botany, pointing out the beauty of its application, and giving detailed instructions for putting it into practice. In an introductory chapter he points out the great value of leaf-prints as an aid to the student. "One great object," he remarks, "of the study of botany is to enable the student to recognize readily the individuals of the surrounding flora, to call them by their names, and to arrange them according to their degrees of kinship. The number and distinctness of the characteristics of a plant, often concentrated in its leaf, and the comparative ease with which the story written in the leaf can be deciphered, make the study of its morphology peculiarly important and interesting to the beginner in botany." The photographic image obtained by printing by superposition—using the leaf as a negative—renders the character of the leaf most perfectly, clearly indicating not only the general formation, but tracing accurately its venation and detailed structure. An admirable illustration of this is given in the photographic plate published in the work, containing a leaf of the *Acer dasycarpum*, one of the common maples of America; a leaf of the *Polygonatum multiflorum*, or Solomon's seal; and an example of the maiden-hair fern, or *Adiantum pedatum*, all printed on one piece of albuminized paper. On the value of the study of leaf-structure, and the facility which photography offers for assisting such study, Professor Himes further remarks,—

But the fronds of the ferns reward in the highest degree the study of leaf morphology. Almost all specific and generic characteristics are found in them, when the nature of the fructification, the shape of the sori, their position, &c., is considered, all of which can be perfectly represented by the photographic method used for the illustration, in which the marginal fructification is beautifully rendered. Thus the plate of this, one of the lower orders of vegetation in our earth's flora in pre-Adamic times, is written in the impressions of its leaves upon the rocks. They tell that during the carboniferous era, when the vast beds of coal were stowed away for the subsequent use of man, the ferns which at present seem only to serve to relieve, by their freshness and beauty, the waste and gloomy places, preponderated in number of species and genera, and in some of their representatives, even in our zone, aspired to the dignity of treelood, as they now only do in the tropics.

One of the most important points in commencing the production of leaf-prints is the selection of suitable leaves to act as negatives, and on this subject Professor Himes gives apt instructions. To secure the most definitely marked results in printing, vigorous leaves gathered late in the season answer best, those gathered in the spring being least intense. The dried leaves of a *hortus siccus* may be used, the specimen-plate having been printed from such; but freshly-gathered leaves give the best results. Here are some hints for the selection and treatment of the leaf negative:—

In gathering leaves for photographic purposes, some care should be taken to procure perfect and characteristic specimens. The margins should be kept as free from overlapping as possible when the leaves are placed in the printing-frame or pressed. Some are more easily managed if very slightly wilted, but generally, the sooner they are subjected to a slight pressure the better. A portfolio or ordinary atlas, supplied with sheets of printing-paper, should be taken to the woods, in which the most delicate one—as the maiden-hair, fine-haired mountain fern, &c.—can be placed as soon as plucked. Many leaves can be printed from without pressing or drying, as forest leaves, many ferns, columbine, anemone, black currant, &c.; but when the pines of the leaf may be expressed by the pressure used in printing, and stain the sensitive paper, it will be necessary to subject them to some pressure between the folds of bibulous paper. They should not, however, be dried as for an herbarium.

The ribs and veins in prints made from undried leaves appear as sharply-defined dark lines, and the whole appearance of the prints is superior to those made from dried leaves in which the ribs and veins are represented by comparatively ill-defined white lines. The maple leaf of the accompanying illustration can therefore be easily surpassed by any reader by printing from a freshly-plucked leaf.

The reason of the difference alluded to lies in the fact, that the ribs and veins, whilst filled with the fluids which they convey, are transparent, and allow the light to pass through and make a record

of them in dark lines. When dry and empty, they are opaque, and, by preventing the action of light, produce white lines.

Dried leaves may be made to give prints in all respects equal to, and sometimes even superior to, those obtained from freshly-gathered ones, by soaking them for several hours in water until the veins become expanded and filled. They must then be pressed between the folds of bibulous paper until dry enough superficially to print from. After this treatment they will only remain in good photographic condition several days, but the operation can be repeated as often as desired. A little glycerine added to the water will cause the veins to remain transparent longer, and a little hydrochloric acid will facilitate the filling of the veins in some cases.

When it is desired to print from several leaves upon the same piece of paper at the same time, it will be found convenient to fasten them to the glass by means of dilute gum-water. Immediately after being fastened to the glass in this way they should be subjected to the pressure of the clothes-clip as in printing from them. In some cases it is best to place the leaves—especially dried ones—between folds of writing-paper, and subject them to as great a degree of pressure as can be obtained by means of an ordinary letter-press, before fastening them on the glass. If the leaves are not of the same intensity, the most intense—those that require the longest time to print—may be bleached as much as necessary by means of Labarraque's solution, or those least intense may be stained light yellow by means of turmeric. Small plants with flowers that preserve their shape somewhat in pressing—as violets—can be photographed entire.

As all prints taken from the leaves themselves must consist of a light image on a dark background, Professor Himes suggests that for many purposes an improved effect will be produced by using the print first obtained as a negative; first treating it with wax, to render it transparent. The following is the method recommended:—Melt some pure white wax by placing it in a shallow dish placed in a pan of boiling water. Immerse in the melted wax sheets of blotting-paper. As these sheets will absorb much more wax than is required, a pile is to be made of (say) half-a-dozen of these with half-a-dozen clean sheets of blotting-paper, placing alternately waxed paper and clean blotting-paper, a few extra sheets of the latter being placed at top and bottom. The whole pile is then pressed with a flat-iron heated to about the temperature of boiling water. By this treatment a series of uniformly waxed sheets of blotting-paper will be obtained. When a print is to be waxed for use as a negative it is placed upon a sheet of blotting-paper, and then upon its face is laid a sheet of the waxed paper; this is then covered with two or three sheets of blotting-paper, and the whole pressed with the hot iron. The negative is thus uniformly waxed, and made sufficiently transparent for printing purposes.

Lucid instructions are given to enable the amateur who is not familiar with photographic operations to print from the negatives so obtained, either by the ordinary silver processes, by the ferrideyanide of potassium process or the bichromate of potash process. With each of these processes most practical photographers are familiar. We may, however, briefly mention here the formula for the two latter. The first of these gives blue prints. Prepare,—

Ferrideyanide of potassium (red prussiate of potash)	...	...	...	...	100 grains.
Water	...	...	...	...	1 ounce.

Apply the solution with a tuft of cotton to a piece of *Saxe* paper pinned to a board. This will give paper of a uniform yellow tint. This, on exposure to light, becomes blue; the only fixing process necessary being copious washing in water until all trace of yellowness is removed. A saturated solution of bichromate of potash produces brown images by similar treatment; excess of washing having a tendency to decompose the image of brown oxide of chromium, and leave a pale green image of sesquioxide of chromium.

This volume opens out to amateurs in various studies a new means of preserving examples and patterns, and to botanists especially, suggests a method of study elegant in itself and invaluable as an aid to systematic progress.

Critical Notices.

THE PHILADELPHIA PHOTOGRAPHER. Vol. IV. 1867. (Philadelphia: BENNERMAN and WILSON.)

THERE is no contemporary photographic journal which we take up with so much pleasure as the *Philadelphia Photographer*; none in which we are so certain to find something which will well repay reading; it is, in fact, altogether a model of what a monthly photographic journal should be. The energetic and able editor, Mr. E. L. Wilson, is already assisted by many of the ablest writers on various departments of photography, and we note that he has just strengthened his staff by the accession of Professor Towler, formerly editor of *Humphrey's Journal*, who will now contribute regularly to the *Philadelphia Photographer*. Amongst the writers whose valuable articles have aided in giving interest to the volume just closed, we find, besides that of the Editor, the names of Carey Lea (whose researches generally first appear there) Dr. Vogel (who is German correspondent), the Rev. J. H. Morton, the Rev. A. A. E. Taylor, Professor Henry Morton, Coleman Sellers, J. C. Browne, F. A. Wenderoth, C. W. Hull, G. Mathiot, Professor O. N. Rood, J. Zentmayer, J. Q. A. Tresize, Dr. Liesegang, and many others, all of whom contribute excellent original articles. A very interesting feature of this journal is the publication each month of a photographic picture illustrating some point of interest. A number of very capital cabinet pictures appear, amongst other subjects, in the present volume, and have, we doubt not, helped to popularize its picture and secure its success. The question has at times been asked by some of our correspondents as to whether we could not occasionally issue examples of processes in our pages, and we have had to regret its impossibility, as the cost of almost any form of mounted photograph would exceed the wholesale price for which a copy of the *PHOTOGRAPHIC NEWS* is sold. In America a different state of things prevails. Photographic literature is not there nearly so low-priced as in this country. Here the standard price for a manual of instructions in photography is one shilling; there it is one dollar, or four times the amount. The price of each number of the *Philadelphia Photographer* is half-a-dollar; but we consider it cheap at that sum, and commend it to any of our readers who, in addition to excellent information, would like to see a good example of photography every month by a first-rate man.

We may add here that our esteemed friend, the Editor, has made arrangements to send us advance proofs of any important original articles which appear in his pages, so that our readers will have the earliest access to any interesting matter in connection with photography transpiring amongst American photographers.

ON THE PRODUCTION OF PHOTOGRAPHS IN PIGMENTS: Containing Historical Notes on Carbon Printing, and Practical Details of Swan's Patent Carbon Process. By G. WHARTON SIMPSON, M.A. (London: THOMAS PIPER. Newcastle: MAWSON and SWAN.)

FOR obvious reasons we cannot enter into any notice of this work beyond noting the fact of its issue, and briefly mentioning its contents. After a brief *resume* of the history of carbon printing from its origin until the present time, the chief part of the work is devoted to a minute statement of the practical details of all the operations in Swan's carbon printing process. These instructions are based on a careful observation of the operations in the Newcastle carbon printing establishment, and upon observations during much personal experiment and practice; and they are moreover made authoritative by having undergone Mr. Swan's examination for verification or revision.

There are, also, chapters on the theory of the action of

light on chronic salts and organic matter; upon the selection of the various materials used; upon colouring carbon prints; upon Faults, Failures, and Remedies, and other subjects of interest connected with the process. The frontispiece to each copy is a very fine example of carbon printing from a negative, in some cases by Robinson, and some by Faulkner.

THE YEAR-BOOK OF PHOTOGRAPHY for 1868.

Edited by G. WHARTON SIMPSON. (London: PIPER and CARTER, Gough Square.)

A YEARLY resume of the progress of photography and an epitomized statement of materials have grown to be necessities amongst photographers, as the eager demand for the YEAR-BOOK OF PHOTOGRAPHY illustrates. We cannot, of course, speak here of our own part in producing the work; but we may speak with pleasure and pride of such an array of contributors of original articles of current or permanent interest, such as has rarely, if ever, been brought together in one work. Besides a restatement of the principal processes in constant use in the forms in which they are now practised by the ablest authorities, and synopses of the best formulæ, and of the new and modified processes of the year, here are upwards of forty original articles by various contributors, of the titles of the principal of which a brief recapitulation may be interesting. Mr. Francis Bedford treats on landscape negatives and some hints for their improvement; and there are few men in the world whose dictum would carry so much weight on the subject. Mr. Mudd writes on art knowledge and photography, and all the world knows that in writing of art and photography he is speaking of something which his practice shows that he thoroughly understands. Mr. Robinson points out, with caustic force, common fallacies concerning photography, in which both photographers and the public indulge. Mr. Hughes describes a new method of reducing the intensity of negatives, with a practical authority that carries weight. Mr. R. Manners Gordon describes a dry process, the plates by which, whilst very sensitive, and yielding negatives of rare excellence, have perfect keeping qualities. Mr. Blanchard has several excellent contributions, all on interesting subjects, and valuable as arising out of his own practice. Dr. Anthony describes a capital dry process. Mr. Spiller gives a most useful chapter on the detection of impurities in photographic chemicals. Mr. Swan describes a method of transferring carbon prints without the aid of a press, which will be invaluable to amateurs. Mr. Dallmeyer treats on lenses; Mr. Fry on keeping negatives; Mr. Cherrill on photographing machinery, and on the sulphocyanide toning bath; Mr. Werge gives hints on copying Daguerreotypes; Mr. Bovey, the preservation of sensitive paper; Mr. A. Keene, on dry plates; Mr. F. G. Eliot, on a successful method of reducing overprinted proofs; Mr. J. Eastham, on harmonizing contrasts and shortening exposures, and, also, on retouching negatives; the late M. Claudet, on a unity of measure, for use in enlarging; Mr. England, on his experience in commercially working his new dry process; Mr. H. Cooper, on preserving and improving prints by paraffine; Mr. Woodbury, on transferring negatives; Mr. H. B. Pritchard lays down the conditions of non-success; Mr. A. Hughes gives a curious experience in printing; Mr. Mawdsley, a chapter of instructions for alkaline development; a capital printing and toning process is described by Mr. M. Whiting; Mr. J. R. Johnson has some excellent hints on copying and enlarging; Mr. Cuthbertson gives some simple calculations, suggesting a ready way of ascertaining approximately the angle of view included by a given lens; and Mr. Burgess describes a simple drying box. These are some of the subjects treated, and may enable our readers to judge of the interest of the work.

ANOTHER NEW DRY PROCESS.—SOAP IN COLLODIO-BROMIDE OF SILVER.

MR. CAREY LEA contributes to the January *Philadelphia Photographer* some interesting details of experiments in dry-plate photography, which, by the courtesy of the Editor, we are enabled to lay before our readers early. The object of his researches is to secure the two valuable conditions of greater sensitiveness and more simplicity in preparation; the least complex of the dry processes in use involving, in his experience, manipulations at least twice as much work as the wet process. "It was, therefore," he remarks, "with a view of finding something simpler and more convenient for my own use that I set to work to experiment. After some consideration I selected Messrs. Sayce and Bolton's ingenious collodio-bromide process as the best basis for experiment, and set out to find whether it could not be possible to obtain a substance which, simply added to the collodio-bromide, would act as a preservative. If this could be done the whole labour of preparing the plate would be reduced, after the collodion was poured on, to a simple washing and drying.*

"I soon found that a variety of substances would produce the desired effect. With benzoic acid I obtained a tolerable result. My next step in advance was in the use of shellac varnish. I had previously observed that shellac in solution gave a precipitate with nitrate of silver, and that this precipitate was sensitive to light. I therefore added a few drops of lac varnish to the collodio-bromide mixture, and obtained a tolerable picture.

"Gum guaiacum contains a considerable quantity of an acid termed guaiacic acid, which combines with silver. The introduction of tincture of guaiacum with the collodio-bromide was found to give rather better results than the last-mentioned substance, but, as a still better agent was obtained, experiments with it were discontinued.

"Several years ago it occurred to me that oleate of silver, in view of its sensitiveness to light, might become valuable in photography, and as far back as 1863 I made various experiments with it, which are referred to in passing, in an article I published in the *Philadelphia Photographer* for February, 1864. I therefore concluded to try this substance in connection with the collodio-bromide, and found it to give results much better than any of the preceding, especially when used together with camphor. I obtained, in this way, very satisfactory results. Every part of the process is easy and simple. As the preparing a solution of soap in alcohol is somewhat troublesome, I avoid this objection by using an official tincture, which can be procured anywhere, and is always ready. The details are as follows:—

COLLODION.

Alcohol	1 ounce
Ether	1 1/2 "
Bromide of cadmium	4 grains
Bromide of ammonium	3 "
Camphorated tinc. of soap	5 minims.

A supply of this should be made and put away for at least a week to ripen.

"Grind some nitrate of silver to a very fine powder; it must be, not like a fine sand, but like flour, perfectly impalpable. This should be done in a perfectly clean mortar; an agate mortar is best for all such purposes, and will be found a useful adjunct to every experimental photographer's apparatus. Weigh out 40 grains of this pulverized nitrate, and add to it 3 ounces of the collodion. Shake up thoroughly at intervals for about four hours, after which either filter through sponge in a common collodion filter, or let stand five or six hours to subside; I prefer the former method decidedly.

* At the time I made these experiments, I was not aware that Mr. Sayce at one time had suggested the employment of tannin in the collodio-bromide. He seems to have abandoned the idea, as in his communications for some years past he has not referred to it. My preservative agent is very different, and my plates retain their sensitiveness after a thorough washing, thus giving every reason to expect thoroughly good keeping qualities.

MODE OF OPERATING.

"Edge the plate with 1-grain solution of rubber in benzole, or with dilute albumen (white of 1 egg, 4 ounces water, 30 minims liquid ammonia, and filter through cotton or paper). The former is the least trouble, because the plate can be collodionized at once; if albumen be used, it must, of course, have time to dry. Collodionized in the usual way, let stand about two minutes, during which time the next plate is edged with benzole-rubber varnish, and then put the plate right under the tap, provided with a rose to scatter the water; move it about till the water covers the plate freely, and then leave it about five minutes to wash. A tube like an inverted **L**, with a cork in the upper end, to slip over the faucet, and holes punched underneath the bottom at both ends, enables one to wash two plates at one hydrant. This is very convenient for all washings, but especially in the present case, where the plates are so quickly made, and come in so fast to be washed.

"After washing, the plates need only to be dried, and are ready. As to their keeping qualities I am not yet able to speak, as I have tried none longer than a week; but these were not in any way impaired, and there seems every reason to hope for at least an average permanence, or probably more, as everything soluble is, in this process, removed from the plate.

DEVELOPMENT.

"This is the regular alkaline development. The form that I have used is,—Moisten with water, and, when equally wet, apply a 1-grain solution of carbonate of ammonia, adding to it a drop or two of a 10-grain solution of bromide of potassium, and a drop or two of a 60-grain solution of pyrogallie acid in alcohol.

"As the image comes out, add more pyro, giving plenty of time; a little of a stronger solution of carbonate of ammonia may also be added. If sufficient density is not obtained in this way, wash off, pour on dilute acetic acid; pour this off after a minute or two, and add it to plain pyro, with a little solution of nitrate of silver 15 grains, citric acid 15 grains.

"This process gives plates rather more sensitive than the coffee process, and has the advantage of being materially less trouble.

"P.S.—Further experiments, made since the above was in the printer's hands, showed that an alcoholic solution of aloes gave still better results. The best proportion has not been ascertained. The aloes are boiled with alcohol in a test-tube, and a few drops added to the collodion instead of the tincture of soap. Probably commercial tincture of aloes will be found to answer equally well.

"Further experiments are in progress, and the results will be communicated. The exact determination of the relative values of different sensitizers is laborious and troublesome. The whole subject is one that gives a great opening for experiment."

AGAINST THE USE OF DISTILLED WATER FOR PHOTOGRAPHIC PURPOSES.

BY NELSON K. CHERRILL.

I LOOK upon *distilled water* as one of the greatest mistakes of the photographic laboratory. It is, I believe, quite useless in all the useful operations of practical photography. For the purposes of scientific experiment, for elaborate comparisons of the respective values of certain solutions, for a few unimportant dry processes, and for those who believe in *hand-books* and *books of instruction*, distilled water may be found an indispensable necessary; but in the ordinary course of photographic work I do not find any advantage gained by its use, or any disadvantage to accrue from substituting for it the ordinary water as it is "laid on," which is of course much cheaper, and which serves every purpose.

The water which is supplied to me now contains, I doubt not, a most delightful list of impurities, and these abound in sufficient quantities to render it exceedingly nice to drink

(a sure sign of great impurity), and to throw down a great milky-white precipitate with nitrate of silver; yet I use it for making nitrate baths, and for every other photographic purpose, with great success.

For the nitrate bath, the most delicate of all the solutions used by the photographer, nothing more is required with this or any other sample of similar water than the addition of a few grains of silver to a gallon or so, or an ounce of old bath-solution may be thrown into a considerable bulk of the water. The precipitate formed may be, if thought well, collected on a filter, and the paper added to the silver-waste box, or the precipitate may be thrown away; the bulk of it will fall to the bottom of the vessel in which the silver was added to the water, and the slight amount which remains in suspension may be disregarded.

For the developer I never find the slightest difference in effect between one kind of water and another. It does not seem to matter at all about the precipitate formed by the silver in the water; indeed I am not sure it is formed at all, the sulphate of iron decomposing the nitrate of silver before it has time to effect the precipitation in the water of which the developer is made.

I have never been able to see the least use in washing the film with distilled water after the hypo has been all removed from the film. This is recommended by some as a means to remove the impurities of the common water, and so to enable the shadows of the picture to dry more clear and brilliant. I have never found a negative print any the better for all this extra trouble.

I find a bath for printing purposes may be made just in the same way as that recommended for the nitrate bath; i.e., the water cleared first with a little silver, and then filtered or left to settle. I have never made a toning-bath with distilled water that I can remember, and so I cannot speak from experience of the difference (if there is any) between common water and distilled for this purpose; but I never find the slightest fault with my toning baths; they do their work quite well, and that with common water.

I have thought much upon the use of common water for dry plate washings. I am convinced that distilled water is not at all required in any of the best processes. The precipitate from water is only an insensitive silver salt, generally chloride; how should this hurt the film, which always contains bromide and iodide of silver, and often chloride too? It seems to me that the more a dry process depends on some abnormal condition for success the more need there is for using distilled water. I have noticed this particularly with the tannin process. I have done some very good pictures with tannin plates, but of all the processes I ever tried it is the most *uncertain*; success seems to depend on some curious abnormal conditions which no one understands, and the most trifling disturbance, even one so small as that caused by the minute quantities of foreign matter in common water, is fatal to good results. Turn to the other extreme; the most *certain* of all dry processes—the collodio-albumen—to use Mr. Mudd's own words, "distilled water is not necessary in any stage of this process." These things may not be fully understood yet, but till they are, I say, give up those processes which need distilled water, because they depend upon *uncertain conditions of success*.

RECENT EXPERIMENTS WITH COLLODION.

THE results of the experiments detailed by me in my last paper were:—

1. That strongly-iodized collodion was more sensitive to sombre rays than a weakly-iodized compound, and yielded, therefore, more harmonious and softer pictures.

2. That weakly-iodized collodion gave harder pictures, which were liable to become fogged by the employment of a strong developer.

The conclusions which may be drawn from these results are obvious. If softness and sensitiveness are required, a

strongly-iodized collodion should be used; but if greater contrasts are desired (as in the case of dimly-lighted landscapes), a collodion containing but a small proportion of iodizing salt should be used, together with a weak developer, in order to prevent fogging.

Many would conclude from these circumstances that, in the reproduction of drawings or designs made up of minute lines only (in which, therefore, there is no half tone), a weakly-iodized collodion would be best adapted to the purpose; but this is not the case. My experiments were made with a strongly-lighted object (a white plaster bust), whereas drawings are reproduced in such a manner that only a weak image of the same is shown in the camera, the whitest description of paper appearing in such pictures darker even than black drapery in a photographic apparatus. It stands to reason, therefore, that the collodion which is least capable of yielding an image of the black drapery is not sufficiently sensitive for the reproduction of drawings which depend for their perfect formation chiefly upon the obtainment of opacity in the white of the negative. I have already called attention to this fact, and have found by experience that in the reproduction of poorly-lighted objects a sensitive collodion gives the best results.

I will now continue the result of my researches. After the institution of my experiments with iodized collodion of a thick and thin consistence, I believed that similar results would be obtained in working with thin and thickly-poured collodion films; two plates were coated, therefore, the one very thickly and the other as scantily as possible, and placed together in the dipping bath. A portrait was taken on each of the plates, and both developed as nearly as possible in the same manner. The difference in the results obtained, although not very great, was nevertheless observable; both showed an equal amount of detail, but in the thinner film the lights were a little more intense and the shadows slightly weaker than in the thicker one, giving the former negative a more brilliant appearance, without any loss of delicacy. The result of this experiment affords a reason why many portrait-photographers, who have a good eye for gradations of light and shade, are in the habit of using a collodion of a thin consistence.

But how is the phenomenon to be explained? At first sight, one would think that as a thick film of weakly-iodized collodion no doubt contains about as much iodine and bromine salts as a thin film consisting of strongly-iodized collodion, the result in both cases would be nearly identical. That such is by no means the case is shown by the above experiments; for a plate prepared with weakly-iodized collodion proved itself to be much less sensitive than a thin film of the strongly-iodized material. The explanation of the matter lies, most likely, in the proportion that the gun-cotton bears to the iodizing salt; this is obviously double as large in the weakly-iodized material as in the strongly-iodized collodion, and to this circumstance is, no doubt, due the inequality which exists in the sensitiveness of collodions.

(To be continued.)

ARTISTIC PICTURES PHOTOGRAPHICALLY CONSIDERED.

BY E. DUNMORE.*

THE difficulty of selecting the title of a paper will, I trust, be considered sufficient excuse for occasional digression from it. The sweeping criticisms to which any photographic picture is subjected that aspires to be something beyond an ordinary matter-of-fact photograph is patent to all, and has the effect, no doubt, of damping the ardour of many an ingenious and artistic photographer. It is all very well to say, "Spare the rod and spoil the child;" at the same time, too much rod is a bad thing.

It would be disparaging the ability of a class of men whose mechanical ingenuity is well known, to suppose for an instant that there are not many perfectly able to do all the *necessary manipulations* of, we will say, a composition picture as well as it is possible to do it, and as well as it has been done. This admitted, the other condition—undoubtedly the most difficult one, and may, perhaps, be considered as *the difficulty*—is that of finding men sufficiently artist to design, as well as possessing the power of embodying their ideas in the anything but plastic envelope of photography. That there are great difficulties must be readily admitted, when we consider that the proper knowledge necessary to success includes the thorough acquaintance with many arts and sciences which will dovetail as they do so intimately one into the other.

How is it we see so few good composition pictures when many real artists are themselves photographers? Is it because of the difficulty attached to the work, or that the results do not repay the trouble, or both combined? One thing, as yet composition pictures are but a beginning of what will be when our attention is more especially directed to the art rather than to the necessary manipulations, almost the synonym for a photographer. Even now hundreds are capable of making perfect negatives, when but a few years back not one in a hundred could do so; eventually but few in the profession will be unable to produce perfectly-manipulated pictures. Then photographers will not be judged of so much by faultless workmanship as by the skill displayed in the design and composition. The foundation of our pictures will then be based on the most solid principles of art. The fashion with many, of planting their cameras almost haphazard where there may be pretty scenery, or what not, will become obsolete, and outrages upon every art axiom, now so plentifully scattered about, will, in a great measure, cease to be, and photographic pictures will gain in quality what they lose in quantity.

How shall he go to work to hasten this most desirable state of affairs? I may say, "What shall we do to be saved?" Keen competition and low prices are decidedly adverse. It is not an inducement to spend one's time and money upon what will be, after the most lavish expenditure of care and skill, hawked about for a few shillings. One great and good thing now, as far as we can determine, is the possibility of rendering our pictures permanent, which demolishes at once the most forcible objection—that of fading away. Before we could do so few would be inclined to invest their money largely in what, although a thing of beauty, was not a joy for long, frequently but for a month or two. Now it is different. Given the requisite negative, a permanent impression can be made exceedingly beautiful, and delicate as a refined painting. Why, therefore, should not a photographic picture, skilfully composed (I say this advisedly) and made permanent, be as valuable as another monochrome drawing by another process? I feel confident that were more attention given to the *art* qualities of photography, a greater number of composition pictures would be the result, and truth would also more frequently be combined with beauty. At the same time, I do not presume to place photography upon an *equality* with painting, or as a rival to other *coloured* works of art; for we all know that colour, judiciously applied, will of itself go a long way in making a picture, as the inspection of many of the gems of celebrated colourists will testify. Instance many of the figures in Turner's pictures, which are wretchedly drawn, but most skilfully and judiciously coloured, so much so that the ill drawing is entirely overlooked, the colour and general effect engrossing the whole attention; therefore the absurdity of placing them in comparison. As Opie observes, in alluding to colour, it is the "sunshine of art, that clothes poverty in smiles;" but, unfortunately, we have to apply sunshine in another manner.

The general depression in the photographic trade-profession is undoubtedly owing, in a great measure, to want of novelty. One good photograph repeats another so much,

* Read before the North London Photographic Society, January 1st, 1867.

in general appearance, as to be monotonous, and the best of them are slightly remarked upon as "only photographs." That the family likeness is strong there is no disputing; and if photographic pictures are to become intrinsically valuable as works of art, it is evident that the true pictorial element must be more thoroughly amalgamated with them, so that they will be exponents of the thoughts as well as of the manipulative skill of the individual photographer. Photographic pictures, broadly speaking, should be an assemblage of lights and shadows, so as to form large masses of tints (*vide* Salomon); these, again, divided into smaller masses, until every appearance of contrivance is lost, and the whole together takes that harmonious and artless appearance which so exclusively belongs to natural arrangements. At the same time the whole picture should be subjected to the first intention, that whatever impression or sentiment was to have been conveyed is fulfilled in all things in the picture working together for one end. Unless the photographer does this he had better leave composition photography alone.

With many other professions periodical meetings are held, and rewards, in some form or other, are given for the best productions. The Sketching Club is an instance of the successful working of this plan, and its arrangements undoubtedly tend to increase a love of the art for itself. Why could we not do something similar in addition to our ordinary meetings, and let these be increased to every month throughout the year? I believe it has been suggested, but nothing as yet has come of it. We are certainly dependent upon daylight for our work, and could not manufacture a picture by candle-light in an hour or so; but we could exhibit pictures made from some special suggestion in the interval between the meetings. I am, of course, presuming that the theoretical, and some practical, knowledge of drawing would be part of the stock-in-trade of each member, and who would be expected to contribute a picture at each meeting, worked out from the suggestion given. The details of such an association, of course, requires consideration. I merely suggest, or re-suggest, the broad outline of a plan I believe would be attended with good results, would be worth a trial, and give an impulse to an unmistakably languishing profession, by making the production of good pictures a matter of friendly rivalry and love of art, rather than exclusively one of profit. The profit would, however, be a natural consequence before long. Again, a common idea is that photography can only achieve as much as it has done—can, in fact, be no more than a mechanical process. New apparatus can be made and applied in new directions; we may improve definition and straighten the lines, but as to real advancement, from an artist stand-point it is out of the range of possibility.

Composition pictures are certainly the most daring attempts to burst the bounds of what is considered the limits of a process, and are attempts worthy of imitation by all. It is not, however, to be expected that we could produce lovely faces and figures as a skilful painter could imagine, with all the lofty supernatural beauty denied to us mortals. Fact, uncompromising fact, is what we have to deal with, and we must confine our attention to material subjects, and in the varied and beautiful forms of nature find employment for our cameras. Being denied the ideal, and limited to earthly subjects, we must make up by light, shadow, and general outline for the deprivation. Much may be done, quite enough to allow a wonderful advance upon the present state of our particular craft.

Light and shadows are our sheet-anchors. A clever arrangement of the chiaroscuro, and a few touches, will make a picture, when myriads of touches and bad lighting will make a photograph the derision of everyone who knows anything about art, perfect, perhaps, in its chemical aspect, but horrible in its pictorial one.

It is evidently labour in vain to attempt to imitate the beautiful faces and forms of a Raphael or a Guido; but we can make a picture full of sentiment and beauty from the

material we have at our command. A difficulty certainly exists in getting suitable figures, and in using them, when we have got them, to the best advantage. Our landscapes are always beautiful, and do not lack variety, and the time may come when paid living models will be as necessary to the landscape photographer as to the painter.

If the production of high class clever pictures were so easy, their value would of course be less. The greater the difficulty of production the greater the worth. When we see a beautiful result we are apt to overlook the time, care, skill, energy, and battling with almost insuperable difficulties necessary to its production: the result is all we know, if it be good or bad. If good, no one can imitate it without undergoing the same ordeal to procure the negatives. The very difficulties enhance the value of the work, and, as I have before said, I believe the fewness of really good works causes the popular idea that photographers are incapable of doing better.

The productions of many of the great painters supply to us admirable studies of the proper balance of light and shade to which I have before alluded as of the utmost importance to the photographer.

I may here mention that the extraordinary power which the eye possesses of excluding all other things when bending its greatest strength of vision on any particular object, or part of an object, is highly interesting, and may be considered as the leading principle upon which chiaroscuro is based. The contrast of light and shade by which both seem to be increased in intensity when in near proximity one to the other is a quality in the laws of vision most invaluable. We may gain much by studying the activity of the eye; its conclusive mode of reasoning, or rather the vast power it has when cultivated of forming true conclusions, apparently without the necessity of reasoning proceeding from that power, we may call unconscious knowledge. The careful study of these things will confer much more real benefit than the commonplace attentions they usually get, for upon these niceties of light and shadow the picture has solely to depend for all that is to give life and piquancy to that portion of effect that comes under the head of chiaroscuro. Many pictures will show, upon careful inspection, certain principles most carefully observed by each master. Amongst those to whom I would specially call attention as being most suitable for the study of the photographer are works of Rembrandt, Corregio, Rubens, Van Steer, Tenier, Ostade, and Ruysdael. Rembrandt, for instance, usually makes a great mass of shadow serve as a foil for a small quantity of light; Claude *vice versa*. We may recollect, in Rembrandt's works, clever arrangement of the chiaroscuro constitutes one of the principal beauties of his pictures. Ruysdael, too, whose pictures of Nature in her more sombre moods are most beautiful—you cannot look at them without feeling their power and truthfulness; in fact, the study of our national pictures ought to be the care of every photographer.

Photographs are representations of reality, frequently too real to be beautiful; but by well managing the light and shade, and by the judicious introduction of figures, a work may be produced that will be the link between a drawing by hand and the more elaborate oil-painting—a source of gratification to lovers of true art, and of profit to the artist. We have numerous instances in which the drawing and chiaroscuro are sufficient to make a notable work of art even when the colouring is but indifferent. This fact alone proves we have the power of making pictures if we only properly apply it. We must not forget that any one can, by practice and attention, produce perfect chemical results; but it requires a real love of true art, and a just appreciation of the beautiful (qualities that may be obtained, more or less, by study), to be able to make a picture. This is the real secret of successful picture-making. This is the quality that can never be brought to such a degree of perfection as to be unimprovable; the more it is elaborated the wider seems the scope for improvement; each stage of advance but seems to unfold others before unthought of; and, to quote

an old-fashioned rhyme, perhaps a trifle vulgar, but appropriate,—

"Each big flea has a little flea
Upon his back to bite 'un;
Each little flea has lesser fleas,
And so ad infinitum."

Intimating that each little knowledge not only adds to the general store, but begets other knowledge before hidden and unthought of. We should therefore give our attention more particularly to the art of *picture-making*, and not let the manipulative part monopolize quite so much of our thoughts as it has hitherto done, but bring ourselves to consider the means as inferior to the end; and we shall yet produce tangible proofs that photography is not only a mechanical-chemical curiosity, but the means of producing truthful, beautiful, and artistic *pictures*; and the year that we this day enter upon will be to all, both photographically and socially, a truly progressive, prosperous, and happy new year.

RESUSCITATION OF THE OLD TONING AND FIXING SOLUTION,

AND THE TREATMENT OF THE SOLUTION WHEN EXHAUSTED
OR SATURATED.

BY PROFESSOR JOHN TOWLER, M.D.

It requires more than ordinary boldness and a daring disposition to give countenance to a condemned fashion, a cut of coat out of date, or an ostracized actress. The same boldness and daring will scarcely preserve us unscathed when we assert that, in our humble opinion, the old toning and fixing solution, consisting of hyposulphite of soda and chloride of gold dissolved in water, is equal, if not superior, to any other toning and fixing solution now in vogue. This assertion is not founded on fancy, on a mere desire for change, on eccentricity, but on the result of numerous practical experiments; from these experiments we deduce (subject, of course, to amendment, change, or revision, according to the development of further results) that the toning and fixing solution of hyposulphite of soda and chloride of gold is more economical, more certain in the production of a given tone, and more easy of manipulation than any of the other toning and fixing solutions. It remains to be seen whether, by the slight modifications introduced, there are no drawbacks in the way of the prints turning yellow, after a time, by exposure to air or moisture; other faults or disadvantages we do not anticipate, nor do we regard the more rapid exhaustion of the fixing powers of the hyposulphite solution of any account or moment; in fact, some photographers never use this solution more than once; and we have ourselves frequently made this recommendation. Let this advice, however, be recanted, for we find that the solution can be used repeatedly before it becomes saturated with chloride of silver; and, until it is saturated, it is operative of good and uniform results.

Before we give the exact formulæ for the preparation of the toning and fixing solution, it may be well to discuss, in a few words, the separate toning functions both of hyposulphite of soda and of chloride of gold (for the former is just as much a toning re-agent as the latter), and then to examine the results when the two are combined.

In the first place, let a print, when taken from the pressure-frame, be well washed in several changes of water (in the dark room, of course), and then immersed in a strong solution of hyposulphite of soda. You are all familiar with the almost instantaneous change of tone produced on the print, from whatever shade of colour it may previously have had, to a very *light chestnut*; this chestnut hue is the separate and independent result of the hyposulphite of soda, and it has been adopted by Beyse and Joss as the fundamental flesh-tones in their patent* for producing colours on prints by development.

If the print be not previously washed, but removed

directly from the pressure-frame to the soda solution, the tone produced is somewhat darker; it is still, however, a chestnut hue—a *dark chestnut*. The soluble silver salts in the print have combined to produce the slight modification of hue from a light chestnut to a dark chestnut. But the dark chestnut hue is not produced instantaneously; it requires several minutes, probably a quarter of an hour, the length of time required to fix the print; that is, to remove the chloride of silver in the print that has not been modified by the action of light. During this quarter of an hour the well-washed print retains the same light chestnut tone which was produced the moment it was immersed. Hypo-sulphite of soda, therefore, alone produces on a silver print a *chestnut-coloured tone*, and at the same time dissolves out all the unchanged chloride of silver: this is its fixing property.

Now let us see if a solution of chloride of gold has any effect upon a silver print, either on collodion, on albumen, gelatine, or plain paper. We all know that this solution has been recommended as a means whereby to intensify a negative; and whilst performing this operation we have observed how the tone of the negative *gradually* changes from the grey-white of the silver picture to an *inky* hue; if the solution be strong, the change is very rapid, almost instantaneous. The intermediate tones, before the ink-hue has been attained, are more pleasing, because more warm, being a varied mixture of red and blue. The same result is observed when a paper-print is immersed in the gold-toning solution, consisting simply of neutral chloride of gold. If carbonate of soda, phosphate of soda, citrate of soda, acetate of soda, or chloride of calcium, be mixed with the chloride of gold, we have the result of the two combined, which is slightly different from that of the gold-salt alone. But if we examined carefully, or observed accurately, we must have seen that the gold-salt not only changes the tone of the silver print, but seems also to exercise a bleaching influence upon the colouring matter of the print. This property is observable both on the negative and on the print; and it is to this pernicious effect that we attribute, or may frequently attribute, the improper and unseemly contrast of excessive black and white on prints: they have been bleached, the extremely fine markings have all disappeared, the middle tones have become very faint, and the inky blacks alone predominate. We are inclined to think that, in every case of substitution under similar circumstances, a part of the print must be lost. Here gold takes the place of silver; and, where the markings or shades are very fine or thin, it is natural to suppose that the silver, as it retires all at once, carries with it, as it were, in a vortex, the cause or substance that attracted the gold. But we are beginning to theorise, which was not our intention. The separate and independent action of chloride of gold on a silver print, then, is two-fold: it tones the print, and bleaches it. The final tone is that of an *inky blue*.

Let us now examine the results of the combination of these two toning materials on a silver print. There are two cases: the one is when the print is submitted to the gold solution first, and then to the hyposulphite of soda afterwards; and the other is when the print is immersed in a mixture of the two solutions at the same time.

It is a law in mechanics, that the resultant of two or more forces is the same, whether the forces act separately or co-simultaneously; in chemistry it is very probable that the law will not be always verified; for one chemical ingredient, by getting the start, may do damage, which the other may fail to retrieve. In this way the gold toning solution acts; that is, when it is used separately and prior to the use of the hyposulphite toning solution; for by its bleaching property the fine and thin shades, or mezzotints, as well as the delicate lines, points, and marks, are all more or less deteriorated, and the print, if kept in this toning solution until the blue or the violet tint has been arrived at—until, in fine, the gold has displaced the silver which originally formed the picture

*The translation of this process will soon appear.

—will be very much impaired in vigour and brilliancy; in fact, it will be a feeble, a bleached picture. Now when this bleached picture is immersed in the so-called fixing solution, it is submitted to two actions—a toning action upon the parts which form shades and middle tints, and a solvent action upon the chloride of silver which has undergone no physical change from light. Neither of these actions has any power whatever to restore the parts that have been destroyed by the gold toning solution, nor do they add to the vigour of the print by increasing the contrasts, because the toning of the hyposulphite does not owe its efficacy to accretion or deposit. Hence it is that such a picture leaves the fixing solution as weak and bleached as when it was placed in the same; it has simply changed its tone and been fixed.

Have we any reason to allege that the action is different when the print is immersed at once in a mixture of the two toning solutions? Let us see.

Suppose it is immersed in the hyposulphite first, until it is toned to a chestnut hue, and fixed. It will be observed that, in this case, it has undergone no deterioration such as that which is produced by the gold toning solution; in fact, we shall be constrained to come to the conclusion that hyposulphite of soda tones and fixes without bleaching.

Secondly. We shall observe, furthermore, that all attempts to tone the print with the gold solution after it has been toned and fixed in the soda bath are futile; we can hence conclude that the latter solution must have some restraining action upon the gold solution when the two are mixed together. These, then, are the only theoretical reasons at present known, which ought to induce us to rely upon the mixture of the two toning solutions, as preferable to the application of the gold solution first, and hyposulphite afterwards. In practice, we find that the print is much less injured in the mixed toning solutions than when treated by the modern method of toning and fixing in separate baths. In the mixed bath the pictures are decidedly more brilliant, and every tone that can be composed of a chestnut hue and a blue-black by the varied admixture of the two solutions that produced them can be obtained in this mixed bath if the prints are allowed to remain in it the proper length of time. Our readers may be inclined to think that the prints must be in some degree injured if they are allowed to remain several hours in the hyposulphite solution. We have not found this to be the case, and our experience is derived from the toning and fixing of more than seven hundred stereographs during the last month. Some of the prints remained in the mixed solution over night, and were found the next morning as black as an engraving; if kept in still longer, the tone assumes a greenish tinge. But in all these cases there is no difficulty in removing every trace of hyposulphite from the prints by subsequent washing; and when this is effected, there ought to be no alarm about their keeping properly. With these preliminary remarks, we will now proceed, and describe our present toning and fixing process.

TONING AND FIXING SOLUTION.

Water	...	...	...	32 ounces
Hypsulphite of soda	...	...	...	8 "
Acetate of soda	...	...	...	4 drachms
Chloride of gold	...	...	...	15 grains.

Dissolve the gold previously in an ounce of water, and then add it to the stock solution. Keep the stock solution in an open bath all the time, and add to it fresh gold and hyposulphite when required. It is a good plan to dissolve fifteen grains of the gold salt in two ounces of water, and add a drachm of the solution to the bath each time or day just before you are going to tone. Throw into the solution also about half-an-ounce of hyposulphite of soda after each day's severe strain upon it. In this way it will work for a long time, care being taken to supply fresh water as it becomes exhausted by evaporation or convection with each print when removed from the bath. The solution, too, is always ready and in good working condition to receive the

prints direct from the pressure-frame, without any previous washing. In this way the bath is seldom overcrowded with prints at the same time, for, as one goes in, another, in general, is ready to be removed to the water-dish.

(To be continued.)

STUDIO HINTS.

BY A PRACTICAL MAN.

Varnishing.—As this practice will be most extensively adopted since Mr. Blanchard's method of preserving prints has been made known, all who wish to avoid vexation and trouble in regard to the brush should keep their varnish in a wide-mouthed caper bottle, the flat brush fixed through the cork; and as the varnish gets used and lower in the bottle the brush can be pushed further through the cork, to be always in the varnish.

A cheap and effective substitute for a *Glazing Press*, and admirably adapted for the new cabinet portraits, may be arranged as follows:—A roller of beech or birch, from one to two feet long, and of good proportionate thickness, must be accurately turned and polished. The print is to be placed on a sheet of plate glass, or the top of a smooth, hard, heavy table, or it may be placed between pressing-boards. The roller is then to be placed on the top, and worked backward and forward, mangle fashion, with a heavy lithographic stone. This will give a highly-glazed surface to prints at a small cost.

Graduated Backgrounds (cheap, effective, and can be made by any one).—Get six or eight feet of the 4-ft. 6-in. wide cartoon paper, or a very large sheet of brown packing-paper, some of which is made in very large sheets; damp it, and strain against a wall, or strain on a frame previously covered with thin calico; when completely dry and tight, mark a circle in the centre, or about where the sitter's head would be; then put some common lamplack in a saucer or plate, and work it round the centre circle that has been left for the head, taking it up with a cloth as wanted. This, with very little trouble, will give an admirably graduated background, either from a dark centre to light outside for grey, white, and light heads, or a light centre to dark outside for dark heads. If the brown paper centre is to, dark, bring it up with a rubbing of flake white. This only wants trying, to be universally adopted, as it is so simple and so easily done.

Stippling the Glass of Studios, so as to give a flat or ground appearance. This is best done with pure, good, bright and clear white lead, so mixed as to be what decorators would call stiff flatting. This should be dabbed or stippled on with the point of a new, good-sized sash-tool; an old worn-down brush is useless, and will only make dabs and smears. There is also another way of regulating the studio light; viz., by the use of thin blue gauze mediums, as used by panorama painters in producing some of their soft and graduated effects; the blue gauze used in theatres for making the dresses of fays and fairies is the article to be used. This can be arranged so as to cover any desired part of the top or side lights in one, two, or three thicknesses, and be the means of producing a variety of soft, artistic, and satisfactory effects.

The Cabinet Background will be found useful. It is formed by hanging three frames together; to fold, open out, or shut up like a large clothes-horse. This, judiciously used, will give great relief and roundness to the figure, as the light may be increased or diminished by merely splaying or contracting the frame on the side nearest the window; a frame must also be arranged to soften the top light. The frames forming the two sides and back must be skeleton-frames, to be covered with open leno or blue gauze, and, by their arrangement and modification, will produce a great variety of pleasing effects.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual Monthly Meeting was held on the evening of Wednesday, the 1st inst., in Myddelton Hall, Mr. W. W. KING in the chair.

The minutes of a former meeting having been read and confirmed,

Mr. E. DUNMORE read a paper on Some Art Aspects of Photography (see p. 19).

After a vote of thanks, it was resolved, as the meeting was small, to adjourn the discussion on the paper until the February meeting.

Correspondence.

CARBON PRINTING.

SIR,—After my season's work, which, I am happy to say, puts me out of the position of joining in the dolorous chorus which is being pretty generally sung by the profession of late (the more is the pity), I took a week's holiday to myself for the purpose of seeing what was doing away from home, determined to bag every wrinkle that could be turned to good account in future practice.

I have long desired to try my hand at carbon printing, but, I dare say, like many more, was deterred from doing so by the conflicting statements made regarding its practicability. So, when out for my week, I one day turned my steps towards Newcastle, and called on Mr. Swan, and, sir, if he were a stranger to you, I would tell you of the kind and gentlemanly manner in which I was received; my only letters of introduction being a few cartes, the backs telling where I did them, and the other side showing how. He kindly requested me to accompany him to the printing establishment, and there I saw the process gone through with pictures of every size, from cartes up to whole sheets, and in every variety of tone suitable to the subject, from pure black to a warm brown, all equal, so far as I could judge, to what silver prints would be from the same negatives, and as regards uniformity in depth of printing superior.

I was so thoroughly satisfied with what I saw that I resolved that my first work on my return home would be a trial at carbon printing, and the few cartes I enclose will give you an idea of my success. I find the working of it so simple and certain that I would have no hesitation in adopting it for all my work; and consider that Mr. Swan is justly entitled to substantial remuneration for the skill, painstaking perseverance, and time he must have expended in bringing the process to such perfection.

I noticed lately that Dr. Vogel suggested the use of the screw press for transferring—a good idea—but, I think, only suitable for the first transfer. Where quantities were done the screw press would be valuable, as the undeveloped prints could be neatly laid on the caoutchouc-coated paper (an uncut sheet, if the press was large enough), and piled into the press between sheet-brass or printers' pressing-boards, when one squeeze would do for hundreds of prints. The re-transfer requires a much sharper nip to ensure perfect adhesion, and for this a copper-plate or lithographic press is better adapted.

JOHN HENDERSON.

Perth, Jan. 6th, 1868.

[The prints which Mr. Henderson encloses are excellent. The question of screw pressure *versus* rolling pressure can only be decided by experience. Mr. Cherrill, who first proposed it, has succeeded very well with the screw press, and Dr. Vogel confirms his view. Our own predilection, theoretically, is in favour of rolling pressure, with which we have succeeded. As yet, however, we have not tried the screw pressure.—ED.]

SUGAR IN THE PRINTING BATH.—INDIA-RUBBER MOUNTING.

DEAR SIR,—I beg to thank you and Mr. Bovey for the hint as to the use of sugar in the printing bath. I tried it some weeks ago, when you first mentioned the subject, and, as no formula was given, I added one drachm of sugar to each pint of a 40-grain silver bath. I have, within the last few days, obtained prints with perfectly pure whites, on paper which has been excited three weeks. I fancy that the paper is a little more sensitive after this treatment, but of this I cannot speak with certainty, as I have not tried a sample prepared with and without the sugar side by side.

I have been trying the india-rubber mounting, but without much success. I made a 20-grain solution in benzole. It took some days to dissolve properly, but appeared all right at last. I then mounted some cards, as I thought with success, and after rolling they looked very nice. To my disgust, however, when I looked at them some hours after, the heat of a warm room had made most of them curl up from the mount at the corners, and in some, half the prints were off. Is there any remedy for this?—I am, sir, gratefully yours,
PROBATUS EST.

[The tendency in the print to leave the mount is a common result of using too thin a solution of india-rubber. A very attenuated layer is comparatively useless. In using glue or paste it is a maxim to apply the thinnest coating possible. 'A carpenter will tell you that the best joint is made with the smallest quantity of glue, and he will sometimes rub two surfaces together to press out all superfluous glue. But it is to be observed he uses the smallest quantity possible of glue of the *right thickness*, not glue made as thin as possible. It is possible to make glue and paste too thin to secure adhesion. But the conditions in using india-rubber are altogether different. It does not dry into a hard substance binding the two surfaces to which it adheres. It continues in the form of an elastic gum, a thin layer of which readily yields to a strain which is greater than its own elasticity. It is necessary, therefore, that the layer should be thick enough to resist any possible tension to which it may be subjected. A 20-grain solution ought to be strong enough, but it has probably been spread thin.—ED.]

EXPLANATION.

SIR,—We shall be obliged if you will kindly allow us space in the News to declare that we have nothing to do with "A. B.," who in your last advertisement cheap printing, and refers to Mr. Seeley, of Ware.

We think that surely competition in *price* has reduced photography as profession too low already!

The effort should rather be to raise both price and quality.

A. AND E. SEELEY.

The Ferns, Richmond Hill, Jan. 8th, 1868.

Talk in the Studio.

THE MEETING OF THE PHOTOGRAPHIC SOCIETY.—At the next meeting of the Society, to be held on Tuesday evening, in Conduit Street, Mr. J. Spiller, F.C.S., will read a paper, entitled, "Researches on the Hyposulphites and other Fixing Agents. Part I." We hope that a good attendance will be present to hear a paper on such an interesting subject.

GUN-COTTON AND NITRO-GLYCERINE.—Professor Doremus, at a recent inquest held in the United States on the bodies of several men killed by a nitro-glycerine explosion, stated that if gun-cotton be immersed in the proto-chloride of iron it turns into common cotton; the same experiment was tried with nitro-glycerine by mixing it with proto-chloride of iron, and it reverted into common glycerine. If gun-cotton or nitro-glycerine is not carefully washed to get rid of the acid, a gradual decomposition will ensue, producing gases which, if the vessel be closed, will explode. Nitro-glycerine carried

about exposed cannot explode, even if you drop a coal of fire into it; if the liquid is confined, or is under pressure, then an explosion will ensue. If gunpowder or the fulminates of mercury, silver, or gun-cotton be ignited in a vacuum by a galvanic battery, none of them will explode.

PHOTOGRAPHY AND THE RAILWAY CARRIERS.—A case of some interest to photographers in the transit of their productions has just occurred at Penzance. It appears when the Science and Art Department decided on allowing a series of their framed and glazed photographs to be sent to the West for exhibition, in connection with the schools of design at Penzance, the agent of the railway into whose hands they were placed for transit to their destination entered the cases containing the photographs, &c., as books. Now, to make the transaction better understood by the general reader, it should be stated that the railway companies have three scales of charges: books, £2 per ton; pictures, with glass, £4 per ton; and plate glass, £6 per ton. It appears that by a little sharp practice the person entered the pictures as "books," and got them conveyed at the rate of £2 per ton, and then charged those to whom they were directed for plate glass, at £6 per ton. Now the foreman of the Committee was sufficiently wise, though he did not come from the East, to know that this was a very exorbitant charge, and refused to pay it, when another account was handed to him somewhat lower; but this he deemed too much, went to the railway managers, had the whole affair opened up and inquired into. The case was then heard before the Penzance magistrates, who inflicted a penalty of twenty shillings on the agent, at the same time saying, that had the principals been before them in the case they would have imposed the full penalty of £10 and costs; so that photographers in sending their goods to exhibitions, &c., must be careful, and see that the cases are properly entered and properly described, as the Act of Parliament gives the railway companies great power in any case of wrong description and entry.

DISHONESTY.—Some weeks ago, we reported the committal of Walter Whitlow, for the theft of negatives, prints, &c., from his employer, Mr. Duffy, of Bath. At the recent session he was found guilty, and sentenced to six months' imprisonment with hard labour.

PHOTOGRAPHS OF PAINTINGS.—One of the most celebrated landscape painters of France, who has just died, M. Theodore Rousseau, has, by his will, instructed that all the works remaining in his possession are to be collected and photographed, and, if circumstances permit, they are to be published in a collected form, after the manner of the "Livre de Verité" of Claude Lorraine, or of the "Liber Studiorum" of Turner.

To Correspondents.

A SUBSCRIBER.—There are various methods of making a plain paper print transparent. Either wax or varnish will answer; but if you require it to be attached to glass the use of a varnish will answer your purpose best. The print should first be soaked in hot water to remove the size as completely as possible. It may then be treated either with mastic varnish, or a varnish made by dissolving Canada balsam in turpentine. A strong spirit varnish might be used, but as it dries rapidly the manipulation is not so easy. The print should be saturated with varnish, and the glass surface coated with varnish, and the two brought together carefully so as to exclude air-bubbles.

F. A. N.—The best plan for such a side-light as yours is to have the curtains sliding on a rod with rings, the whole curtain for the side, triangular piece as well, being in one piece. A cord must run along the rod, being attached to each ring, running over a pulley at the highest end, and hanging down. By pulling this string the blind will slide along and up the rod; the cord by which it is pulled can then be tied to a hook so as to hold the blind in position, drawn just to such extent as may be required. 2. All the samples of aluminized paper you name are, we believe, good. We have, especially, heard Nos. 1, 2, and 5 praised; but we have not made comparative trials of each, and cannot speak absolutely from personal knowledge.

AMATEUR.—It is probable that the lens to which you refer, of the maker you name, will answer your purpose; No. 3 will be best for the size you require. For pure landscape, nothing will answer your purpose better than the first landscape lens you mention. Possessing these two lenses you are right in conjecturing that the triple will be comparatively unnecessary.

A BEGINNER.—The copyright of a photograph taken to order, and

for what the statute terms a "good and valuable consideration," does not vest in either the producer, or the person ordering, without an agreement in writing made at the time, stating to whom the copyright is to belong. The producer of any photograph ordered and paid for by another has no right to sell the prints without the consent of the person so ordering; but neither of them possesses a copyright without an agreement. The only case in which the copyright vests in the producer without any agreement is where he produces the photograph at his own charge and for his own purposes. The cost of registration is one shilling for the fee, and one penny for the "form" to be filled up. Personal attendance at the Registrar's Office is necessary. Our Publisher will superintend the proper entries, and pay the fee of a form properly filled up, if one shilling and three-pence in stamps be sent to him. A separate entry and separate fee is necessary for every view of any object. One entry and one fee only protects the picture in one negative, and any other negative with the slightest variation requires separate entry and fee.

TWELFTH NIGHT.—The negative you forward is not well adapted to the production of transparencies for the magic lantern. It is not dense enough and not clean enough; the lights are feeble and the shadows are fogged. For copying engravings for such a purpose you will find the use of an organico-iron developer well suited, as aiding in the production of clean shadows. Your exposure has been a little too long also, and it is probable that your collodion is new. Try adding a few drops of tincture of iodine to your collodion until it is a deep sherry colour. In copying an engraving be very careful to have it quite flat and the camera quite parallel with it. 2. The use of a background painted in natural colours instead of in monochrome would not impede manipulations, but would make results uncertain and often inharmonious, because of the varying photographic value of colour. 3. If judgment be used, natural objects may often be introduced as accessories in portraiture. We have seen, at times, very effective pictures produced by the introduction of natural foreground objects in front of a painted landscape background scene.

G. WILLIS (Sensborough).—As Mr. Swan's carbon process is protected by a patent, no one can, of course, work it without his licence. The possession of our work on carbon printing carries with it no right to practise the patent process, but will teach those possessing the licence to practise the process. The question of exclusive licences is one of a purely commercial character, and will doubtless be governed by commercial consideration.

W. M.—THE YEAR-BOOK OF PHOTOGRAPHY for 1868 was published on the 27th of December, and has not been out of print since. Any answer "not out" or "out of print" since that date has been given in error.

AJAX.—We do not know of any agent for the Leptographic Paper in London.

F. A. OAKES.—See answer above.

R. N. D.—You require a thicker solution of india-rubber. The 15-grain solution with a large residue which you describe is practically much weaker, probably not more than 10 grains to the ounce. 2. The thin foggy image which you describe may be due to the condition of the bath, or of the collodion, or of the developer. Probably you are using a new and somewhat thin collodion. Add a little more pyroxyline to the collodion, and a few drops of tincture of iodine. 3. In copying a map, use a portrait lens or a triple to secure freedom from distortion, and a moderately small stop. A view lens will curve the lines in the margin.

R. D.—The toning bath turning brown and ceasing to tone is most likely the result of contact with some trace of hyposulphite of soda. Possibly your fingers have been in contact with the fixing bath, and have then been immersed in the toning solution. This will produce the effect you describe. There is no remedy for it; you can only recover the gold by precipitation.

TYRO.—Collodio-chloride of silver properly prepared will keep in the dark a long time: how long we cannot say. The first sample we made was kept for twelve months before it became decomposed. We do not counsel, however, keeping it for more than a few weeks, as if free nitrate of silver be present, as it should be, it has a tendency to act upon the collodion, making the film rotten. The film leaving the paper is generally due to the use of a very tough collodion.

PICKLE.—The first of the recipes for joining glass to which you refer, if managed properly, will be found to answer. A thick solution of isinglass with a little powdered hydrate of lime made into a paste will make a good cement; or, quicklime and cheese made into a paste with a little water holds well.

C. W. H.—Regarding the subject of your strictures it is difficult to say anything here, except that there are many and varied tastes in existence. Thanks for your complimentary remarks on the YEAR-BOOK.

To Correspondents.—Communications from LACHLAN MACLACHLAN, A. E. SCALES, and others in our next. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XI. No. 489.—January 17, 1868.

CONTENTS.

	PAGE		PAGE
Silver Soap as a Sensitive Agent	25	Resuscitation of the Old Toning and Fixing Solution. By Prof.	
Hyposulphite of Ammonia for Fixing	25	Towler	31
Another Sensitive Salt for Photographers—Fluoride of Silver...	26	Proceedings of Societies—South London Photographic Society	
The Use of Clouds in Landscapes. By Lux Graphicus	27	—London Photographic Society	31
The Magic Lantern and Photography. By James Martin	28	Correspondence—Remarks upon the Chemistry of Photography	
On Natural Clouds in Landscape Photography. By J. R. John-		—On the Use of Distilled Water—India-Rubber Mounting	
son	28	—Soap in Dry Collodion—Edge's Photos.—Double Printing	
Researches on the Hyposulphites and other Fixing Agents.		and Mr. Edge's Pictures	33
By John Spiller, F.C.S.	29	Talk in the Studio	35
		To Correspondents	35

SILVER SOAP AS A SENSITIVE AGENT.

NOTWITHSTANDING the experimental activity which often prevails in photography, it is singular how long a known sensitive agent will remain little examined and unutilized. The oleate of silver is one of these substances. About five years ago M. Quaglio called attention to its use in a method of photo-lithography, of which we have heard no more. M. Carey Lea, Dr. Liesegang, and others, gave some attention to it about the same time. Dr. Phipson, in his *Préparateur Photographique*, published four or five years ago, referring to this substance, states that it is extremely sensitive to light, blackening completely in an exposure of from five to seven minutes. He mentions that spread upon a piece of ground glass, and exposed under a negative, it yields a print of a fine black tint, which may be fixed by treatment with dilute hydrochloric acid, followed by hyposulphite of soda. Some time in the year 1866 we received a communication from an ingenious correspondent, Mr. R. Courtenay, some fine examples of instantaneous photography, accompanied by the information that the accelerating agent he employed in his collodion, which at once gave rapidity and vigour, was oleate of silver. We suggested at that time that this organic salt of silver would probably prove of service in the dry collodion processes, and, further, that in our collodio-chloride process, which would probably prove valuable in securing fine prints. We commenced some experiments with it for the latter purpose; which, from the intervention of other important engagements, were, however, never carried out. The simple experiment then made consisted in adding about three grains of Windsor toilet soap, finely scraped, to an ounce of collodio-chloride of silver, and, after a few hours, trying it for printing. The sensitiveness was enormously increased, and a considerable accession of vigour was secured. The results were full of promise; but, as we have said, the experiments were pushed aside by other matters at the time, and have not been renewed. We shall resume the experiments at an early opportunity.*

M. Carey Lea, to whose activity and ability as an experimentalist photographers are already largely indebted, has recently made a new application of silver soap, which promises to prove of great value. He also uses it in a dry collodion process, but in an extremely simple and elegant manner. Taking the collodio-bromide process of Messrs. Sayce and Bolton, he forms in it oleate of silver to supply the sensitive organic salt which is found necessary or desirable in dry processes generally. The results are described as very encouraging, which, *a priori*, we are quite prepared to believe. The collodio-bromide process, under the management of Mr. Mawdsley, at the Liverpool Dry Plate Com-

pany, gives plates admirably stable and certain, with a degree of sensitiveness exceeding that of most dry plates, and it seems very probable that the addition of an agent like oleate of silver will still further increase their sensibility.

In his formula, which we published last week, Mr. Lea recommends the use of an official tincture of soap, chiefly on the ground that, being employed in pharmacy, it can be purchased ready for use, and that alcoholic solutions of soap are troublesome to prepare. As the tincture of soap to which he refers is an American preparation, the argument of facility in obtaining it is not available to the English reader, to whom, therefore, as the preparation of his own soap solution, or his own oleate of silver will be necessary, a few words on the subject may be useful.

Oleate of silver is a yellowish white substance somewhat resembling wax in texture; it is not soluble in water, but readily soluble in ether and alcohol, and therefore in collodion. It is formed by mixing six parts of nitrate of silver in concentrated solution with seven parts of Castile soap in strong solution. The oleic acid and margaric acid, which are united with a soda base, combine with the silver, and a precipitate, consisting chiefly of oleate of silver, with a little margarate of silver, is thrown down, leaving nitrate of soda in solution. The precipitate is washed, and pressed dry between folds of blotting-paper. It may be added to collodio-bromide or collodio-chloride of silver in this form, and will readily dissolve in the proportion required.

A still simpler plan of operation would consist in the preparation of an alcoholic solution of soap, to be used in the preparation of the collodion. Most of the alkaline oleates, stearates, and margarates, are in some degree soluble in alcohol, and will form a strong solution, if cut into shavings and digested for some time; or the soap might be added in fine shavings direct to the collodio-chloride or collodio-bromide, without much risk of inconvenience. As the soaps with a potash base are most soluble in alcohol, they should be chosen. Common soft soap, which is an oleate of potash, may with advantage be used for this purpose. Two or three grains of this oleate added to each ounce of collodio-bromide or collodio-chloride of silver when it is first prepared—having, of course, about an equal weight of free nitrate of silver present to combine with it—will, it is probable, give a sufficient proportion of oleate of silver, without leaving any troublesome residuc.

HYPOSULPHITE OF AMMONIA FOR FIXING.

In Mr. Spiller's interesting paper on Fixing Agents, read before the Photographic Society on Tuesday evening, he mentions that on using a bath of hyposulphite of ammonia subsequent to the ordinary fixing of the print, he was

* We have, since writing the above, repeated the experiment with similar results. We shall have more to say on the subject shortly.

enabled to eliminate all but a very minute trace of the silver always left in the whites of the print after fixing with hyposulphite of soda; and expresses a conviction that if the ammonia salt can be introduced cheaply into commerce it will prove a great boon to photographers.

Mr. Spiller proposes to prepare the hyposulphite of ammonia, by double decomposition, from hyposulphite of baryta and carbonate or sulphate of ammonia, the hyposulphite of baryta being formed by mixing, in nearly equal parts by weight, chloride of barium with hyposulphite of soda, in concentrated aqueous solutions. The product is a pure salt of hyposulphurous acid and barium: a sample before us, prepared by Mr. Spiller, is in very fine, minute, and beautifully lustrous crystals something like pyrogallie acid in appearance, and something of the saponaceous feeling of stearite to the touch. From its insolubility it is, however, useless to the photographer, and is chiefly interesting from its fitness for the use for which Mr. Spiller proposes it. The practical extent to which hyposulphite of ammonia will prove a perfect fixing agent can, of course, be only determined practically. Theoretically it should promise a solvent power much more complete than that of other hyposulphites from the behaviour of the base ammonia as well as the hypochlorous acid towards salts of silver.

Our object now, however, is to mention that in the spring of last year we received from an esteemed correspondent, Mr. F. H. Redin, Governor of Carlisle Gaol, and a skilful amateur photographer, some excellent prints which had been fixed with hyposulphite of ammonia. Tested with sulphide of ammonium the existence of silver in the whites appeared much less than is common; but still it was manifestly present. Mr. Spiller has used it as a second bath to eliminate, if possible, the silver from the whites of a fixed, albuminized print. If the use of a second bath be conducive to this end, notwithstanding the extra trouble, many a conscientious photographer will not hesitate to use it. When the old mixed toning and fixing bath was in vogue, Mr. Lake Price used to employ, and recommended in his useful book, a second bath of a strong, fresh solution of hyposulphite of soda to secure perfect fixation, applied when the print had acquired a proper colour in the first bath.

At the time we received the prints to which we have referred from Mr. Redin, he informed us that the hyposulphite of ammonia was prepared by a new process, by Mr. Lesh, one of the visiting justices of the gaol, and that he was prepared to introduce it into commerce. We hoped to have heard more of the matter, but it has not again come under our notice. Now is the time, however, to bring it under the attention of photographers in a commercial way.

There is another question of importance introduced in Mr. Spiller's paper. One sample of hyposulphite of soda he examined contained not less than sixteen per cent. of impurity. The impurity was not necessarily injurious to the photographs subjected to its action, but the fixing bath would be weaker in just the proportion in which the impurity was present. To all large consumers of hyposulphite of soda this suggests the importance of testing each stock when first purchased by the simple method indicated in the paper. To smaller consumers, or those unable or unwilling to undertake such tests, it suggests the importance of a liberal use of the fixing salt, so as always to be on the safe side. The use of excess of hypo is only a little waste of a cheap salt; the use of too little is risking the permanence of valuable pictures, and the waste of reputation.

ANOTHER SENSITIVE SALT FOR PHOTOGRAPHERS—FLUORIDE OF SILVER.

WHILE all the haloid salts of silver have been for years known as sensitive to light, the chloride, iodide, and bromide only have been available to photographers. The fluoride of silver, although extremely sensitive, possessed a peculiarity which disqualified it for the uses for which its congeners were

employed—it was soluble in water. The consequence was, that when a fluoride was employed in collodion by Archer and others, the fluoride of silver, formed in the film by double decomposition in the bath of nitrate of silver, being itself soluble, was dissolved by the aqueous solution, and lost from the film as fast as it was formed. The insolubility in water of iodide, bromide, and chloride of silver is the quality which has made them especially suitable for manipulative convenience, whilst the solubility in water of the fluoride has prevented its utilization in photography.

In the course of some recent experiments by M. Prat, another form of fluoride of silver has been discovered, which differs essentially from the soluble salt which has hitherto been known by chemists. The new salt is stated to be more sensitive to light than chloride of silver, and, being insoluble in water, it is available for the operations of the photographer in the same degree as the other haloid salts.

M. Prat's paper, Fluorine and its Compounds, was recently communicated to the French Academy, but will not be published at length until the chemical referees of the Academy have reported thereon. Our excellent contemporary, the *Chemical News*, has, however, a full abstract of the paper, which, as it will possess much interest for many of our readers, we subjoin:—

"M. Prat considers that chemists have hitherto been mistaken as to the composition of fluorides and the theory of fluorine. He regards the fluorides as in reality oxyfluorides, and the equivalent of fluorine as consequently much higher than is usually supposed. He represents fluoride of calcium by—

2 equivalents of calcium	...	...	40.0
1 equivalent of oxygen...	...	...	8.0
1 " the new fluorine	...	...	29.6
			<hr/> 77.6

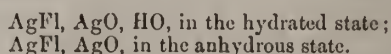
This accords with the known analysis of fluor spar, since it contains 51.5 per cent. of calcium.

"By doubling the old equivalent of fluorine (19), we get 38; that is to say, nearly the sum of the equivalents of oxygen (8), and of the new fluorine (29.6) = 37.6.

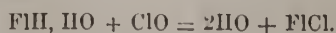
"According to M. Prat, in order to obtain true fluorine, it suffices to heat fluoride of calcium with chlorate, or, rather, with perchlorate of potash, since it is only after the formation of this latter salt that the reaction takes place. Oxygen is disengaged, and also a product which silver absorbs. The compound so formed is fluoride of silver, insoluble in water, soluble in ammonia, from which it is precipitated by nitric acid, and more rapidly altered in the light than chloride of silver. Neither chlorine nor oxygen attack it even at the fusing point of the fluoride. It is, however, decomposed by potash at a dull red heat, and this reaction permits its analysis; it contains—

Silver	...	...	0.785	...	...	108.0	= 1 equivalent
Fluorine	...	...	0.215	...	...	29.6	" "
Fluoride of silver	1.000					137.6	

"This fluoride of silver, insoluble and very stable, and having great analogy with the chloride and the other compounds of this family, differs essentially from the soluble fluoride of silver of chemists, which, according to M. Prat, is a compound of—



"Fluorine combines with chlorine. To obtain this compound it is sufficient to pour a weak solution of the hydrofluoric acid of the chemists into a solution of hypochlorous acid: there form



"Fluoride of chlorine is gaseous, of a more intense colour than chlorine. It converts silver into a mixture of chloride and fluoride.

"Fluorine may be isolated, according to M. Prat, by heating fluoride of lead of chemists (1 part) either with nitre (5 parts) or with binocide of manganese (2 parts): oxygen and fluorine are evolved. A platinum alembic must be used. The oxygen is removed from the mixture by passing over fragments of heated baryta.

"Fluorine is gaseous, almost colourless, of a chlorous odour, visibly fuming in the air, incombustible, and heavier than air. It bleaches indigo, and reddens and bleaches litmus. Ammonia produces fumes with fluorine, and will thus detect traces of it. It immediately decomposes water at the ordinary temperature. It combines with hydrogen in diffused light. Fluorine decomposes hydrochloric acid gas, and eliminates bromine and iodine from their compounds. It unites with boron and silicium, and with all metals of the first five groups."

THE USE OF CLOUDS IN LANDSCAPES.

BY LUX GRAPHICUS.

The subject of printing skies and cloud effects from separate negatives having been again revived by the reading of papers on that subject at the South London Photographic Society, I think it will not be out of place now to call attention to some points that have not been commented upon—or, at any rate, very imperfectly—by either the readers of the papers or by the speakers at the meetings, when the subject was under discussion.

The introduction of clouds in a landscape by an artist is not so much to fill up the blank space above the object represented on the lower part of the canvas or paper as to assist in the composition of the picture, both as regards linear and aerial perspective, and in the arrangement of light and shade, so as to secure a just balance and harmony of the whole, according to artistic principles.

Clouds are sometimes employed to repeat certain lines in the landscape composition, so as to increase their strength and beauty, and to unite the terrestrial part of the picture with the celestial. At other times they are used to balance a composition, both in form and effect, to prevent the picture being divided into two distinct and diagonal portions, as evidenced in many of the pictures by Cuypp; on other occasions they are introduced solely for chiaroscuro effects, so as to enable the artist to place masses of dark upon light, and *vice versa*. Of that use I think the works of Turner will afford the most familiar and beautiful examples.

In the instances cited, I make no allusion to the employment of clouds as repeaters of colour, but merely confine my remarks to their use in assisting to carry out form and effect, either in linear composition or in the arrangement of light and shade in simple monochrome, as evidenced in the engraved translations of the works of Rembrandt, Turner, Birket Foster, and others, the study of those works being most applicable to the practice of photography, and, therefore, offering the most valuable hints to both amateur and professional photographers in the management of their skies.

Before pursuing this part of my subject further, it may be as well, perhaps, to state my general opinions of the effects of so-called "natural skies," obtained by one exposure and one printing. Admitting that they are a vast improvement on the white-sky style of the early ages of photography, they fall far short of what they should be in artistic effect and arrangement. In nearly all the "natural skies" that I have seen, their office appears to be no other than to use up the white paper above the terrestrial portion of the picture. The masses of clouds, if there, seem always in the wrong place, and never made use of for breadth of chiaroscuro.

No better illustrations of this can be adduced than those large photographs of Swiss and Alpine scenery by Braun of Dornach, which nearly all contain "natural clouds;" but, on looking them over, it will be seen that few (if any) really exhibit that artistic use of clouds in the composition of the

pictures which evidence artistic knowledge. The clouds are taken just as they happen to be, without reference to their employment to enhance the effects of any of the objects in the lower portion of the view, or as aids to the composition and general effect. For the most part, the clouds are small and spotty, ill assorting with the grandeur of the landscapes, and never assisting the chiaroscuro in an artistic sense. The most noticeable example of the latter defect may be seen in the picture entitled "Le Mont Pilate," wherein a bald and almost white mountain is placed against a light sky, much to the injury of its form, effect, and grandeur; indeed, the mountain is barely saved from being lost in the sky, although it is the principal object in the picture. Had an artist attempted to paint such a subject, he would have relieved such a large mass of light against a dark cloud. An example of a different character is observable in another photograph, wherein a dark conical mount would have been much more artistically rendered had it been placed against a large mass of light clouds. There are two or three fleecy white clouds about the summit of the mountain, but, as far as pictorial effect goes, they would have been better away, for the mind is left in doubt whether they are really clouds, or the sulphurous puffs that float about the crater of a slumbering volcano. That photographs possessing all the effects required by the rules of art are difficult, and almost impossible to obtain at one exposure in the camera, I readily allow. I know full well that a man might wait for days and weeks before the clouds would arrange themselves so as to relieve his principal object most advantageously; and, even if the desirable effects of light and shade were obtained, the chances are that the forms would not harmonize with the leading lines of the landscape.

This being the case, then, it must be self-evident that the best mode of procedure will be to *print in skies* from separate negatives, either taken from nature or from drawings made for the purpose by an artist that thoroughly understands art in all its principles. By these means, especially the latter, skies may be introduced into the photographic picture that will not only be adapted to each individual scene, but will, in every instance where they are employed, increase the artistic merit and value of the composition. But to return to the subject chiefly under consideration.

Clouds in landscape pictures, like "man in his time," play many parts—"they have their exits and their entrances." And it is almost impossible to say enough in a short paper on a subject so important to all landscape photographers. I will, however, as briefly and lucidly as I can, endeavour to point out the chief uses of clouds in landscapes. Referring to their use for effects in light and shade, I wrote, at the commencement of this paper, that the engraved translations of Turner afford the most familiar and beautiful examples, which they undoubtedly do. But when I consider that Turner's skies are nearly all sunsets, the study of them will not be so readily turned to practical account by the photographer as the works of others,—Birket Foster, for instance. His works are almost equal to Turner's in light and shade; he has been largely employed in the illustration of books, and five shillings will procure more of his beautiful examples of sky effects than a guinea more of Turner's. Take, for example, Sampson Low and Son's five shilling edition of Bloomfield's "Farmer's Boy," or Gray's "Elegy in a Churchyard," profusely illustrated almost entirely by Birket Foster; and in them will be seen such a varied and marvellous collection of beautiful sky effects as seem almost impossible to be the work of one man, and all of them profitable studies for both artist and photographer in the varied uses made of clouds in landscapes. In those works it will be observed that where the lower part of the picture is rich in variety of subject the sky is either quiet or void of form, partaking of one tint only slightly broken up. Where the terrestrial part of the composition is tame, flat, and destitute of beautiful objects, the sky is full of beauty and grandeur, rich in form and masses of light and shade, and generally shedding a light on the insignificant object below, so as to invest it with

interest in the picture, and connect it with the story being told.

From both of these examples the photographer may obtain a suggestion, and slightly tint the sky of his picture, rich in objects of interest, so as to resemble the tint produced by the "ruled lines" representing a clear blue sky in an engraving. Hitherto that kind of tinting has generally been overdone, giving it more the appearance of a heavy fog lifting than a calm blue sky. The darkest part of the tint should just be a little lower than the highest light on the principal object. This tint may either be obtained in the negative itself at the time of exposure, or produced by "masking" during the process of printing. On the other hand, when the subject has little to recommend it in itself it may be greatly increased in pictorial power and interest by a judicious introduction of beautiful cloud effects, either obtained from nature, or furnished by the skill of an artist. If the aid of an artist be resorted to, I would not recommend painting on the negative, but let the artist be furnished with a plain white-sky print; let him wash in a sky, in sepia or india ink, that will most harmonise, both in form and effect, with the subject represented, take a negative from that sky alone, and put it into each of the pictures by double printing. This may seem a great deal of trouble and expense, and not appear to the minds of some as altogether legitimate, but I strenuously maintain that any means employed to increase the artistic merit and value of a photograph is strictly legitimate; and that wherever and however art can be resorted to, without doing violence to the truthfulness of nature, the status of our art-science will be elevated, and its professional disciples will cease to be the scorn of men who take pleasure in deriding the, sometimes—may I say too often?—lame and inartistic productions of the camera.

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 4.

The pigments or colours to be used in painting upon glass must necessarily be more or less transparent, and therefore must be chosen principally for that property; nevertheless, there are some exceptions for special purposes, which require those that are opaque. In the general practice of painting, other qualities are also required; but, as such are not needed for our present purpose, I shall only point to those most suitable for it. The water colours most generally used by glass painters are, for yellows—gamboge, Italian pink, gallstone, and Indian yellow; as reds—carmine, madder lake, and madder carmine; as blues—Prussian blue, Chinese blue, and Antwerp blue; as orange—burnt sienna; as browns—madder brown, Vandyke brown, and copper brown; as black—lamp black. And the same for oil colours, except that ivory black is used in place of lamp black.

As I may suppose that my readers will not be having their colours constantly in use, I think it necessary to warn them, that some colours when ground as oil colours, such as carmine, the lakes, and Italian pink, have the peculiar property, after being kept some time, of becoming viscid, or what is termed fat, so that it is impossible to use them; therefore these and Prussian blue, also Chinese and Antwerp blue, should be purchased in powder, and stored in the small bottles before mentioned, a little being taken out at a time as wanted, and ground well into a stiff paste, with a very little nut oil, upon the glass slab, with the muller or palette knife, and then moved to the pieces of glass before named, each having its separate piece, or, at any rate, placed quite apart from each other: they must be kept free from dust. The slab and muller must be well cleaned after grinding each colour upon it. This is imperative for this reason, the brilliancy of tints depends upon the brightness and purity of the colours used to produce them. For example, gamboge and carmine mixed produce a splendid orange; carmine and prussian blue a magnificent purple. Mix the two

together, and a neutral colour is produced; again add some brown, and you have a dirty smudge of no colour (properly speaking). Cleanliness, simplicity, and decision are the best qualities for a beginner to aim at; softness and tone will be afterwards acquired as the eye becomes more educated. Perhaps these remarks may be considered somewhat beyond what is necessary for the mere painting of a lantern slide, but not so if the student intends to become excellent. I have seen slides that few landscape painters could have equalled upon canvas, and he who painted them must have possessed the education and feeling of a talented artist. In commencing the painting of a picture, the first thing necessary is the design or outline. If a photographic transparency is undertaken, this is, of course, already done as well as the markings of the shadow; but if a copy of any sort of picture in which (such as a line engraving or wood-cut) the shading would be inadmissible, in that case a photographic transparency can be taken, reduced to the size required, laid upon a piece of white paper under the glass to be painted upon, on which an outline must be traced with a fine camel-hair or sable pencil, taking great care to keep the two glasses exactly in the same relative position until it is finished. It is a very good plan to fasten them together by a piece of paper at the edges, which will insure their remaining in the same position. Having secured a true outline of the objects in the foreground and middle distance, a great deal of the outline of the extreme distance may be omitted, marking only the extreme contours and most prominent objects. The outline is to be made with lampblack water colour, used in such a body as to give a black line wherever the brush is drawn upon the glass. When the work is dry, proceed to pare down with the point of the penknife any gouty or uneven lines, using the straight-edge, T square, and bevel, also retouching them with colour as required. Do not be in too great a hurry to remove the under picture, as it is difficult to replace it exactly as it was at first; but carefully persevere in getting a clean and firm outline—which will repay all your trouble—as, without that, paint it how you may, it will never prove satisfactory. The outline is, in fact, the plan of the picture; by it you distinguish the tree from the shrub, the tall man from the boy, an ape from a man.

ON NATURAL CLOUDS IN LANDSCAPE PHOTOGRAPHY.

BY J. R. JOHNSON.*

At our last meeting, on the occasion of Mr. Howard's paper on clouds being read, I took the liberty of observing that although the production of artificial clouds by means of a second negative, taken at a different time from that at which the view was obtained, was an undoubted improvement to the photograph in place of the hard, white sky which it would otherwise possess, yet that the process must be considered a mere artifice or "dodge," and an imperfect substitute for the real clouds, or "atmosphere" of the landscape. I further stated that we possessed means by which the natural clouds, or, rather, the actual condition of the sky and "atmosphere," could be obtained with perfect accuracy; and I proposed, at the next meeting of the Society, to bring forward photographs to prove my allegation. I have come prepared this evening to fulfil my promise.

Upon the table will be found about forty photographs, by M. Braun, of Dornach, the eminent French photographer. They are all from single negatives, and are taken by the wet collodion process, by the Pantascopic camera, upon plates twenty inches by nine. The angle of view embraced is about 125°, or more than one-third of the whole circle of the horizon. I will, however, say nothing of the extent of view, nothing of the general excellence of these pho-

* Read at a meeting of the South London Photographic Society, Jan. 9, 1868.

tographs, but will merely call attention to one of their qualities, viz., that quality which artists call "atmosphere," by which I understand the more or less truthful rendering, not merely of the more obvious atmospheric effects, such as cloud, fog, or sky, &c., but also that more delicate gradation of tints by which the amount of air or space lying between the observer and the more distant objects is indicated, and which, to a certain extent, is an element in the process by which the mind determines the distance of those objects. In this quality these views are unrivalled, I believe I may say unequaled.

They have another merit which will, I am sure, be appreciated by all professional photographers, and that is, that they have proved themselves to be most excellent photographs in a commercial sense. They have been sold by the producer at a very high price; yet in this country alone, I am informed, that the public has purchased them to the amount of nearly £4,000, that value being estimated at the wholesale price. Such a fact furnishes, I think, a fair argument in favour of excellence, and to the prejudice of the "cheap and nasty" style of photography, even when the English "Philistine" public is the arbiter of taste.

While these photographs are before us I am anxious to lay down for our discussion this evening two propositions:—1. I would assert that our photographic processes are capable of rendering, with perfect fidelity, and in all their detail, the natural atmospheric effects of a landscape. 2. That without such real atmosphere the view produced must be imperfect and untrue, whether regarded as an artistic study of nature, or as a mere picture.

If these propositions be established, on a future occasion I will endeavour to prove that this truthful rendering of nature—that is, the production of cloud and sky—and the perfect gradation of the landscape when no cloud is present, may be obtained at all times, and by all cameras, as well as by the Pantascopic camera, provided that proper means for regulating the exposure be adopted.

With regard to the first proposition, I apprehend that I have only to assure the gentlemen present that all the views shown are from single negatives to prove its truth. The views with clouds speak for themselves at the first glance; those where there is an even tint in the sky have only to be examined with a little attention to show that they also possess in a remarkable degree the same quality. Look, for instance, at the views of the Valley of Chamounix, in which no cloud is seen. See the extraordinary delicacy of gradation of each successive peak. The foreground of many of these views is fully defined, and of a mere grey tint, and the sky and distant mountains are not white; yet what an infinity of tones there are between these two extremes! Look up the centre of the valley and observe the beautiful haze which veils, yet does not conceal, the distance. Had these views been taken in the ordinary way—that is, by giving equal exposure to the foreground and to the distant horizon—the great mass of detail in the extreme distance must necessarily have disappeared with such a light as must have been present when these views were taken; for, if the results before you have been produced by giving twenty times as much exposure to the foreground as to that distance, how could an equal exposure to each have succeeded?

With respect to the second proposition, it is, I think, almost equally self-evident with these views under examination. Take the lake scenes. Imagine that the beautiful skies are removed, and replaced by a hard, white surface, while the reflections of those skies in the water remain, as they might possibly do, presenting less intensity of actinic power than the objects themselves; and what would be the result, whether we look upon our view as a study of nature, or as a mere pleasing picture? I need not reply.

Now, what is true of these lake scenes is true, more or less, of all views in which the sky is lost, and has to be added artificially. It is not only in lake or river scenes that the influence of sky and cloud is witnessed; it is in all views. Look at any landscape extended before you, and

note its varying aspect as the sky above changes. How often we see, when wind exists, the shadows coursing each other over the landscape. This is, of course, an extreme case; but there is no view of which the "lighting" does not vary infinitely; and what is the "lighting" but the greater or less interception of the source of light by cloud? In whatever "lighting" we take our picture, then, the sky should accompany it, or we have not all the conditions present which nature presented to us when the view was taken, and of which the peculiar aspect of that view is the consequence.

I will not further trespass upon your time by any additional observations, but will leave the views to speak for themselves, believing that they constitute the most powerful argument which can be urged in favour of natural, over artificial clouds.

RESEARCHES ON THE HYPOSULPHITES AND OTHER FIXING AGENTS.

PART I.

BY JOHN SPILLER, F.C.S.*

NEXT in importance to the discoveries of Daguerre and Fox Talbot may unquestionably be ranked the introduction of hyposulphite of soda as a fixing agent by Sir John Herschel; and so long as photographers were limited to the use of plain papers, or those sized with gelatine only, there was never any difficulty experienced in the complete removal of the silver from the white (unaffected) portions of the paper composing the ordinary photographic print. At a later date, when albuminous coatings came to be applied to the surface of the paper for the purpose of improving the sensitiveness, and giving greater brilliancy and vigour to the resulting print, the few practical difficulties which presented themselves at the outset were believed to be susceptible of being readily overcome. I refer particularly to the tardiness with which the operations of toning, fixing, and washing the prints had to be conducted in consequence of the repellent character of the sensitive surfaces of paper so prepared; and a grand improvement in the subsequent history of albuminized paper was the separation of the fixing and toning processes. Before this practice was adopted prints with "pure whites" (as they were termed) were rarely met with, for the protected portions of the paper were almost invariably tinged with yellow, and the darker shades in the print had usually a bistre or greenish tone. These effects were shown, by Mr. Hardwich and others, to be due to the "sulphuration" of silver in the print as a consequence of the liberation of sulphur from solutions compounded of hyposulphite of soda and terchloride of gold. The normal reaction of these *sel d'or* baths was acid—a condition which proved unfavourable to the permanence of the fixing-salt—and entire success was supposed to be guaranteed when an alkaline gold-toning bath was employed, followed by immersion of the prints in plain hyposulphite.

Whilst these difficulties were being gradually surmounted, a hint was thrown out by MM. Davanne and Girard to the effect that the so-called "pure whites" of the albumen print still retained a small proportion of silver in an insoluble condition, and most probably in the form of sulphide. No notice appears to have been taken at the time of this important announcement, and the eminent French investigators did not seem to appreciate the necessity of addressing themselves to the discovery of a remedy.

At a later period, October, 1862, I was led to an independent observation of the same fact, and at once applied myself to an investigation of the circumstances attending the formation of this silver compound, and the possible means of removal. My experiments went to prove that the metal was retained in the whites of the albumen print, and, indeed, in all parts of the coating, in the form of an argentic-organic compound, colourless, inalterable by light, and

* Read before the London Photographic Society, Tuesday, January 14th

comparatively insoluble in hyposulphites and other fixing agents. It could not be a simple sulphide, for the test by which I discovered its existence in the paper was the production of a brown stain upon moistening the white surface with sulphide of ammonium. It is not my intention to recapitulate the numerous trials I made with a great variety of chemical solvents in the hope of removing the whole of the silver locked up in this form of organic combination; I will merely state that these results were recorded in the PHOTOGRAPHIC NEWS at the time, and that, as the practical result, I recommended the addition of carbonate of ammonia to the ordinary hyposulphite fixing bath, with the view of securing the twofold object of preventing, by its alkalinity, any chemical change or decomposition of the double hyposulphite; and, secondly, of directly aiding, by its special solvent properties, in the removal of this organic compound of silver. Since I had the honour of making this proposal, the advantage of adding carbonate of ammonia to the fixing bath has been practically tested and pretty widely endorsed. It is only by availing ourselves of *all* the resources at command that we can venture to look for a protracted existence of the rich and lustrous photographs upon albuminized surfaces; for, with silver in the whites, the print must be open to the attack of sulphuretted hydrogen gas diffused in the atmosphere, in addition to being liable to alteration by sulphuretted bodies arising from the incipient decomposition of albumen, gelatine, &c. employed in the preparation of the paper, or used for mounting the print.

The use of sulpho-cyanide of ammonium was found to be unsatisfactory when employed alone as a fixing agent, but since I received the assurance of a manufacturer that this salt could be produced at a cheap rate in the event of a great demand arising, I determined to test the efficacy of an addition of the sulphocyanide to an ordinary hyposulphite fixing bath. Since I have had these experiments in hand I notice that M. Obenetter* has recently proposed the use of a combination of ten parts of sulphocyanide of ammonium with one part of hyposulphite of soda as a fixing agent applicable to the new description of collodio-chloride paper prepared by him. The proportions I have used differ widely from these,—my object being to supplement the action of the cheaper salt (hyposulphite),—and I, therefore, adopted the proportions already laid down for the use of carbonate of ammonia, viz., 4 : 1 in ounces respectively, and dissolved these salts together in a pint of water. As the result, I remarked that, from the presence of a trace of sulphide in the sample of sulphocyanide of ammonium employed, the protected parts of the print were not so purely white as usual; but I regret to say that the amount of silver in these portions did not appear to have been sensibly diminished. Mr. Wharton Simpson, Mr. Cherrill, and others, affirm that the use of this salt in the preparation of a toning bath is successful, so that its economic production on a large scale is likely to have an interest for photographers as well as for chemists.

Referring to the use of cyanide of potassium for reducing over-printed proofs, and for removing silver from the whites, Mr. Francis Eliot, in the YEAR-BOOK OF PHOTOGRAPHY, just published, suggests a renewed trial of this salt in aqueous solution, mixed with one-fourth or one-eighth proportion of methylated spirit. Used in this way he considers that it may be safely employed, particularly for the first-named purpose. This opinion coincides with my own experience, and I find that the addition of alcohol induces a more rapid and thorough penetration of albuminized papers subjected to its action; but it must be admitted that if a gold-toned print be thus treated its brilliancy, and colour will become somewhat impoverished. I have not, however yet tried its action upon prints at an earlier stage, as when simply washed from the excess of nitrate of silver. Upon the score of permanence it is much to be regretted that the cyanide cannot be employed for dissolving out the organic compound

of silver, for although it does this most effectually, it seems impossible to prevent a flatness and general want of vigour manifesting itself in prints so treated.

In the course of these experiments I deemed it desirable to test the hyposulphite of soda employed, for the several impurities likely to occur in it from its mode of manufacture. These are particularly carbonates, sulphates, sulphides, and chlorides. For the detection of the first I assume that the use of red litmus paper would prove sufficient; and a small quantity of this kind of impurity, if present, would do no harm. The samples tested by me did not contain any carbonate. The readiest test for the presence of alkaline sulphide is probably the immersion of a bright silver coin in the filtered aqueous solution. This I find by direct synthetical experiments to be a very delicate test, and more readily available than the addition of acetate of lead in small quantity to produce the brown sulphide of that metal. Although the sulphate of lead is nearly insoluble in water, and is usually precipitated on mixing any soluble sulphate with the acetate or nitrate of lead, I notice that this test altogether fails in detecting sulphate of soda in the presence of a fair proportion of hyposulphite. Neither is the detection of this impurity by chloride of barium so simple a matter as we should have expected. The facts are: Firstly, that hyposulphite of soda greatly interferes with the precipitation of sulphate of baryta, and only when the degree of impurity is considerable will there be formed any precipitate, even on standing; secondly, this test fails on account of the gradual production of a crystalline precipitate of hyposulphite of baryta, which would, of course, mask any indication of the sulphate occurring in admixture with it, unless by attending closely to intervals of time or degree of dilution, which would not be possible in practice.*

For the detection of sulphate of soda, it is best to break up the constitution of the hyposulphite by adding a mineral acid. I find the following process answers well, and may be employed quantitatively:—Weigh out 100 grains of the sample of hyposulphite, dissolve in about 5 ounces of hot distilled water, raise the temperature to ebullition, and add half-ounce of pure concentrated hydrochloric acid; boil for five minutes to expel the sulphurous acid and agglutinate the sulphur, filter the solution, which will contain all the sulphate originally present in the sample, and add now chloride of barium to estimate its amount. In carrying out this process upon four samples of commercial hyposulphite of soda, one proved to be perfectly pure; two contained only a trifling amount, not exceeding 1 per cent., of sulphate of soda; and the last sample gave 16 per cent. of impurity from admixture of Glauber salt.

Chloride of sodium was not detected in any of these samples in quantity exceeding 1 per cent. A similar mode of examination was followed, using, however, dilute nitric acid to break up the hyposulphite, and nitrate of silver to precipitate any chloride.

It will be important to notice the fact, that in using a sample of hyposulphite containing altogether 17 per cent. of inert matter in the shape of sulphate and chloride of sodium, an additional one-fifth proportion of the fixing salt should be employed to ensure a successful result. This done, the simultaneous occurrence of these impurities would not be deemed prejudicial.

I have already alluded to a crystalline precipitate which slowly forms upon mixing in equal weights chloride of barium and hyposulphite of soda, both in aqueous solution. I have ascertained that this product is not a double salt, but the pure hyposulphite of baryta, in beautiful pearly crystals of small dimensions, heavier than, but somewhat resembling, pyrogallie acid. This body is interesting, from the circumstance that it enables us to prepare the ammonium-salt of hyposulphurous acid by double decomposition, with either

* The precipitation of the chromate of lead is not altogether prevented by the presence of a soluble hyposulphite, but the chemical reaction is so far modified that a brick red precipitate, instead of the ordinary chrome yellow, makes its appearance.

the carbonate or sulphate of ammonia. From theoretical considerations, this should, of all the alkaline hyposulphites, prove to be the best fixing salt, since it unites within itself the two conditions I adverted to when speaking of the addition of carbonate of ammonia to the ordinary fixing bath; and from my limited experience of the hyposulphite of ammonia, made in small quantity and by the above indirect processes, I consider that its advantages in use, if substantiated by further investigation, would justify the manufacturer turning his attention to the substitution of ammonia for soda in preparing a commercial article. The facility of crystallization, permanence, and other properties of the new salt will have to be determined, and if it can be introduced cheaply into commerce, it is likely to prove a great boon to photographers. Using a bath of hyposulphite of ammonia subsequently to the ordinary fixing solution, I have succeeded in removing all but the last traces of silver from the white portions of albumen prints without injuring the brilliancy of tone for which these photographs are distinguished. I must, however, leave to a future occasion a fuller account of my experiments in this direction.

Woolwich, Jan. 10th, 1868.

RESUSCITATION OF THE OLD TONING AND FIXING SOLUTION, AND THE TREATMENT OF THIS SOLUTION WHEN EXHAUSTED OR SATURATED.

BY PROFESSOR JOHN TOWLER, M.D.*

WASHING THE PRINTS.

This is always an important operation, and must be thorough. We need not dwell upon this part; all know how to wash their prints, and have their own way and notions of doing the work: do it thoroughly. Finally, wash or soak them in a solution of common salt, which removes the last traces of the hyposulphite of soda; wash them again in fresh water, and then dry them. So prepared, the silver picture is more brilliant and vigorous than when toned according to our more modern plan; it remains to be seen whether it is equally permanent. Numerous yellow prints toned in this manner some years ago attest to the contrary; but we believe that in those days the same care in washing was not observed as is now observed; for several prints before us, that were toned in the mixed bath then, are still as fresh and white in the whites as the best prints now when taken from the wash-tub. If the fact of permanency can be proved to be a fact, we have no hesitation then in pronouncing the mixed toning and fixing bath as the easiest, the most economical, and the most reasonable of all existing toning and fixing methods.

DISPOSITION OF THE EXHAUSTED SOLUTION.

We do not yet know any certain criterion or test by which the solution can be easily shown to be saturated with chloride of silver; our plan is to reject the bath the moment it begins to precipitate a deposit; this takes place after it has been in continual operation for about three or four days; that is, after four or five hundred card-pictures have been toned in about a quart of it. Even at this stage it will continue to tone and fix; but it is somewhat doubtful whether it is advisable to trust it much further. The question, then, arises, What shall we do with the solution now?

There are several modes of treating it in order to extract the silver from it.

First method.—Throw into the solution a quantity of granulated zinc; that is, zinc which, when melted, has been poured from a height of three or four feet into a pail of water. By this process the zinc is broken up into small, irregular lumps, suitable for this purpose. Leave the metal in for several days, and stir the solution several times during this interim. The zinc in this operation takes place both of the silver and gold in the solution, and precipitates them—

the former as a fine silver-gray powder, and the latter as a black and a red powder. When the convenient time comes, pour the solution from the metals; add water to the latter, and wash the remaining pieces of zinc well, and then remove them back again to the same solution as before, in order to see that all of the noble metals have been removed. Wash the mixed powder first in dilute sulphuric acid, and afterwards in several changes of water, and then dry it. Place the dry mass or powder in a clean iron ladle, and heat it in an open fire-place to a low redness, and maintain it at this temperature. In this way any salt of silver, such as the sulphide, sulphate, &c., will be reduced to the state of oxide. Boil the powder which has been thus treated in about its weight of nitric acid, diluted with an equal quantity of water, until all is dissolved excepting a small portion of a reddish coloured powder; this remaining powder is gold, which may be dissolved in a mixture of two parts of hydrochloric and one of nitric acid. The former solution is next evaporated to dryness in a porcelain or glass dish; the dry salt is nitrate of silver.

We sometimes avoid the trouble of oxidizing the silver salts, and boil the gray mass at once in nitric acid; but in this way there is some loss.

Second method.—Filter the old bath and employ it for galvanic plating; it is in its present form in an excellent condition for coating copper and brass instruments with pure silver, either with or without the aid of the galvanic battery. It is very possible that you may find a market for this residual substance the moment it is known to be available for the purpose just indicated.

Third method.—Add a quantity of sulphide of potassium (liver of sulphur) to the old bath solution; the silver in this way is precipitated as sulphide, which may be sold as such to the refiner.

N.B.—The silver, which has been precipitated both from the old hyposulphite bath and from moist chloride of silver, is sometimes in a very curious condition—its allotropic condition, perhaps. This condition is shown by its difficult solubility in nitric acid. In consequence of this, we prefer mixing the dry metallic powder with its weight of carbonate of soda, and then fusing it in a Hessian crucible. The button of metal thus produced is now in a very soluble condition when submitted to the action of nitric acid—the gold remains undissolved as a black powder, and may, after separation from the fluid nitrate of silver, be washed first, and then dissolved in nitro-hydrochloric acid.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual Monthly Meeting was held in the City of London College on the evening of Thursday, January 9th, Mr. SEBASTIAN DAVIS in the chair.

After the minutes of a previous meeting had been read and confirmed,

Mr. J. R. JOHNSON read a paper on Securing Clouds in Landscape Negatives (see p. 28). Mr. Johnson exhibited a large number of very fine prints taken with the pantoscopic camera, amongst which were many of Braun's views of Swiss scenery on plates 20 inches by 9 inches, many possessing very fine clouds, and all having graduated and atmospheric looking skies.

Mr. WHARTON SIMPSON said that Mr. Johnson's remarks for the most part carried conviction with them, and that he had stated so much of truth that it was difficult to attempt to discuss or controvert anything he had said. All landscape photographers would doubtless desire to secure in one negative the clouds present in the sky as well as the landscape proper, and the means suggested by Mr. Johnson would often be efficient in enabling the photographer to secure such effects. But there was one point which, although it had been touched upon at the last meeting, had not received so much attention, he thought, as it deserved. Mr. Johnson had referred to the impertinence of securing, at one operation, the clouds and the

* Continued from p. 22.

landscape upon which the shadow of the clouds was cast. But it should be remembered that in a very large number of instances the clouds which cast their shadows on the landscape were right overhead and quite out of the range of the lens producing the landscape, and there was no violation of truth, therefore, in the fact that the clouds seen in a picture were not those the shadows of which were on the landscape at all. He thought that the only point which could be insisted on in the introduction of clouds into a photograph was that they should be harmonious with the picture, and that they should not, by their character and lighting, violate natural or artistic truth.

Mr. BOCKETT said that all photographers would of course prefer getting the clouds in the same negative as the landscape, but for the great difficulty of the clouds always being overdone. He suggested the use of a mask inside the camera.

Mr. SIMPSON said that such a mask was used by Mr. Archer and other early photographers, being made at the time of a piece of brown or black paper torn to suit the horizon of the landscape.

The CHAIRMAN said the rapid movement of clouds caused much of the difficulty of securing them in the same negative as the landscape. The fact that in instantaneous pictures the clouds were often obtained with the same exposure as the foreground showed that it was not that the former required so much less light than the latter, but that their rapid motion destroyed their forms during long exposure. Mr. Johnson's suggestion was, if he understood rightly, to use a graduated diaphragm, which would, however, fail to meet the difficulty of the moving clouds.

Mr. JOHNSON said that the aperture in the pantascopic camera was generally wedge-shaped, or, in some cases, the sides were curved; but always so graduated as to give a gradually decreased amount of light from the foreground to the sky, in which the zenith received less, of course, than the horizon.

A general conversation on the subject followed, in which the Chairman, Mr. Werge, Mr. Taylor, Mr. Johnson, and Mr. Simpson, took part. Mr. Taylor said he tried various methods of securing clouds, but had not succeeded satisfactorily by any method except that provided by the pantascopic camera. Some members pointed out that the graduated sky produced by the wedge-shaped diaphragm was pleasing pictorially, but not natural. Others suggested that where a spire or other dark object projected beyond the horizon line would, with a graduated aperture, be underdone; to which it was answered that practically this was not the case, as such objects received a larger amount of light than lower objects.

Mr. BOOBY stated that he was in the habit of securing clouds by giving a graduated exposure with a flap shutter, which was gradually moved, giving finally an instantaneous movement for the sky.

After some further conversation and a vote of thanks, the proceedings terminated.

LONDON PHOTOGRAPHIC SOCIETY.

THE usual Monthly Meeting of this Society was held at the Architectural Gallery, in Conduit Street, on the evening of Tuesday, the 14th inst., Mr. J. GLAISHER, F.R.S., in the chair.

The minutes of a former meeting were read and confirmed.

Mr. GRIGG exhibited a block for printing with letter-press, together with the original drawing of the "Bowstring Hemp Plant," the printing block having been obtained by photographic means.

Mr. FRANK GOOD exhibited a desk-easel with reflector at the back, for enabling negatives and other transparent pictures to be readily retouched. The easel was provided with a series of loose frames to fit plates of different sizes.

Mr. J. R. JOHNSON exhibited a multiplying camera with some excellent contrivances.

The CHAIRMAN said it was nearly a year and a-half since he had occupied that chair, his absence having been caused by severe illness. Since then the Society had changed its meeting-room, and, as he noticed in the minutes of the previous meeting that the Chairman congratulated the Society on the change, he hoped that there was cause for congratulation, and that the Society would, in its new rooms, go on with increased prosperity. Since their last meeting, the Society and the science generally had suffered a severe loss in the death of his old and dear friend M. Claudet. There was no man who had done more to advance photography than he, none more ardent

in its study, none more willing, at all times, to give the results of his investigations freely to the world. At the recent meeting of the British Association at Dundee they had been much together, and had much conversation on the Society, and on M. Claudet's late work in connection with photography. Now he was gone; and he felt that he could not take that chair without a few words of kind remembrance of one whom they had often seen, and never seen without pleasure. By his death a vacancy was created in the Council, and it was proposed by the Council that his son should be nominated for election, at the next meeting, to fill his place.

Mr. SPILLER then read his paper entitled "Researches on the Hyposulphites and other Fixing Agents, Part I. (see p. 29). In the course of reading, he handed round for inspection examples of several salts referred to in the paper. These were: an example of hyposulphite of baryta; an example of hyposulphite of soda containing 17 per cent. of impurity, chiefly sulphate of soda, the appearance of the hyposulphite not suggesting adulteration; an example of hyposulphite of soda purchased many years ago, when that salt was 2s. per lb., was nearly quite pure. He also exhibited two samples of chromate of lead of the same constitution: one the usual chrome yellow, and the other of a rich red colour, the difference being that the latter was precipitated in the presence of a hyposulphite.

At the termination of his paper, Mr. Spiller exhibited some examples of prints treated in various ways to remove the final traces of silver from the whites of the print. With cyanide of potassium he had been enabled to remove every trace of silver from the whites, but not, unfortunately, without slightly injuring the general brilliancy of the print. By the use of hyposulphite of ammonia applied to a fixed print a considerable portion of the silver was removed, but not all. Adopting Mr. Bovey's suggestion for the employment of sugar in the printing bath, he had tried whether the silver in the albumen might be preserved in a soluble condition; but although he thought the whites contained less silver than usual, still it was not removed. He also exhibited some prints, to show a useful mode of mounting prints employed at the War Office. Perspective views of machines were produced by photography, and reduced photographs of mechanical drawings showing the same machines in section were mounted on the same card, showing the exterior and interior of the machine at one view.

After the Chairman had invited discussion,

Mr. ALLEN asked if it would be possible, instead of mixing the chloride salt with the albumen, to albuminize paper first, coagulate the albumen, and then apply the sensitive salts so as to keep them on the surface. He thought such a course would conduce to permanency.

Mr. HUGHES said the subject to which Mr. Spiller had devoted much attention—"How can we preserve our silver prints from fading?"—was one of vital importance; for, whatever might be the advantages of carbon, it was tolerably clear that silver printing must go on to a great extent for a long time to come, and the world could still be supplied with prints formed of albumen and silver. The question of securing permanency in such prints was one which Mr. Spiller had made peculiarly his own, and had already done much to solve the difficulty. But still much remained. The difficulty of Wedgwood and Davy was in fixing the image they obtained; and it seemed that, after all, we had but half conquered it even now. The enquiry in which Mr. Spiller was engaged was one in which photographers generally could take but little part, they could only express their interest in, and appreciation of, his labours, but not discuss the question or compare notes of experience.

Mr. J. R. JOHNSON said that photographers were much indebted to the labours of men like Mr. Spiller for such important enquiries. But he could not but feel that even when all should be obtained that was now sought in silver printing, they would not be much nearer to the end sought; namely, permanent prints. So long as silver was a metal peculiarly subject to the action of sulphur, &c., in the atmosphere, and suffered discolouration, so long pictures formed of silver, however perfectly produced, must be liable to deterioration and change. Mr. Spiller had given, as the best test for free sulphur, the immersion of a clean silver coin into a suspected solution, and its discolouration would at once reveal the presence of the smallest trace of free sulphur. And it appeared to him, therefore, that permanency was a quality to be sought by avoiding silver altogether.

Mr. HUGHES never intended to imply that absolute permanency could be obtained in silver any more than in carbon.

Even engravings would change by the discolouration of the paper. The whole question was one of degree, as there were the elements of destruction in everything. The presence of silver in the whites of the print where it was not required was one of their chief troubles, as it was there ready at once to register the action of any agency acting injuriously on silver, and show it in the most delicate part of the picture.

Mr. JOHNSON said that the question existed as to whether the silver in the whites was more sensitive than the reduced silver which formed the shadows of the print.

Mr. HART thought the great drawback to photographs was the lowering of the tone of the whites arising from the presence of silver there; and that if it could be removed the chief cause of fading would be got rid of. The reduced silver which formed the dark parts of the print were coated with gold, which would resist the action of the deteriorating agencies to which Mr. JOHNSON referred.

Mr. FRANK ELIOT said, that having already communicated the results of some experiments to the PHOTOGRAPHIC NEWS ALMANAC, he would not enter further into the question than to remark that the print which Mr. Spiller exhibited, in which he had removed the silver from the whites by cyanide, but had also injured the brilliancy of the print, had been too perfectly toned with gold to commence with. Probably, had it been less toned, left in a redder state, the result of the cyanide treatment would not have been so injurious. He would ask Mr. Spiller if he had tried the effect of a little cyanide mixed with the hypo fixing bath.

Mr. SPILLER had not, but thought the suggestion worth trying.

After some conversation,

Mr. SPILLER, referring to the remarks of Mr. JOHNSON, said that the gold toning upon the silver print was an important element not to be overlooked, and if a silver coin were coated with a very slight deposit of gold it would be effectually protected from the action of sulphur. He quite agreed with Mr. JOHNSON, however, that silver prints would always be subject to deteriorating influences.

The CHAIRMAN, in proposing a vote of thanks to Mr. Spiller, remarked that in his practice with the photographic registration at the Observatory they adhered now to the practice of twenty years ago, in using plain paper, in which the insoluble salt of silver formed in the albumen was avoided, and a better chance of permanency obtained.

After a vote of thanks,

The CHAIRMAN, in calling attention to Mr. Goode's easel for touching negatives, described a similar one he had in use at Greenwich. He also mentioned a curious fact, to the effect that having, in order to secure uniform temperature, removed their apparatus for photographic registrations into a room with little ventilation, they found that when the fire and gas had consumed the oxygen in the room, the action on the paper became much less perfect.

It was then announced that at the next meeting, besides the annual business, Mr. JOHNSON would read a paper on a new system of landscape photography.

The proceedings then terminated.

Correspondence.

REMARKS UPON THE CHEMISTRY OF PHOTOGRAPHY.

SIR,—Photography may be compared to gambling, the prizes being few and the blanks many. Yet there are good and bad photographers, just as there are good and bad card players. Games of chance, by the observance of certain laws, often bring success. Photography has its "lucky" ones; so has the turf.

A friend of mine has just told me of a person whom he supplied with instruments and chemicals; and, although he had never done anything before in the art, I am assured that he has taken in the first fortnight a number of very fine photographs. But my friend is afraid, as I am, that his success will ultimately turn out to be his ruin, for he is determined at once to commence professionally. No advice can prevail on him to wait; and, unless a bad case of fogging, followed

by other photographic diseases, immediately afflict him, a hundred to one he will be ruined.

"Tips" are not confined to the turf, for you can obtain photographic information that will relieve you of all your difficulties for 2s. 6d. in postage stamps. If that be too much to believe, why, you have only to send for that collodion and developer which never fail to give perfection. I need not say that if this were so, photographic failures would be almost unknown.

Before proceeding with any further remarks, I think it just to myself to state that this is a subject that I have undertaken to write upon only at the request of a number of friends. There were many weighty reasons for my diffidence, not the least of which was a reluctance to differ very materially with the first chemists and photographers of the day. This feeling amounted almost to a relinquishment of any publication whatever of the results of my experience. Selfish reasons have also had their weight; for I admit that it took some time to consider whether I would be just to myself by giving to the world what has cost me so much in money and time. But, after taking everything into serious consideration, I have determined to freely publish all that I know, on certain conditions—which conditions, if acted upon, will accomplish more in every way than a discussion, which would probably end in nothing of real value.

The wet collodion process has been practised by me professionally since its first introduction by Archer, and what I am willing to communicate has been known to me and tested for two years. I have read nearly all that has been published in English on the subject; but in no publication can I get an insight into the principles of photography, only a list of the different materials affected by light, and the numerous different formulæ for putting them together—some better and some worse, but all very imperfect, inasmuch as the very best seldom give the highest possible result, and when they do they cannot be depended on for any length of time.

The same failures which were inherent in the process on its first introduction belong to it yet. Whatever success some have attained can only be attributed to good manipulation, long practice, and, perhaps, quite as much as anything else, to an almost unlimited choice of material to mix and doctor as experience points out will suit different circumstances. This much is admitted by the majority of leading photographers, as they tell us they have nothing new to communicate.

Photography, as an art, has made giant strides; as a science, it lags behind. Better knowledge of its laws would enable us to enter new fields and gather richer harvests than any yet reaped. From my first connection with photography I have striven earnestly and constantly, sacrificing wealth, health, and comfort—in fact, most things a man values have I counted as nothing in comparison to success in realising an idea of certain chemical combinations that, in my opinion, would throw a new light on the foundations of the science, which idea I had formed before I was in practice twelve months.

Reason told me that what I was working for was quite possible, yet my innumerable experiments so disappointed me, as to often take away all hope of success; but still I persevered, and in time a certain success has rewarded my efforts. But there is much to be done yet, and the knowledge I have already gained has given me the master-key that is certainly destined to unlock every secret.

I will now endeavour to distinctly state what I have and what I can accomplish. First,—I can prepare my chemicals so that I can with certainty produce, consecutively, a great number of the highest class of negatives entirely free from every kind of imperfection; their production can be absolutely relied upon for a lengthened period, and quite out of all proportion to what can be accomplished by any published formula. For instance, I have produced from two ounces of nitrate of silver four hundred half-plate negatives. The chemicals were not altered in any way by me; worked

every day without giving a single failure. This work I set myself to do, and when done, everything remained in good order, and plenty of silver solution left.

To come at once to the object of this article: I will undertake, before any committee specially appointed, to produce, consecutively, 1,000 half-plate negatives, and, as before stated, perfectly free from imperfection. I will also point out the true cause of every failure, as well as remedy the following defects, viz., streaks in the direction of the dip, pinholes, fogging, hard, patchy, and thin negatives, needle points, greasy streaks, brain markings, marblings of various kinds, &c. I feel quite certain that I have a knowledge of the kind of change that takes place when light acts on iodide or bromo-iodide of silver; and I am not without hope of being able to demonstrate this, as I am fully persuaded it is a chemical one.

I am prepared for criticism that may not be favourable, especially as I have not published my process. Mere publication, without the demonstration I propose, would not settle anything, and would not be satisfactory, more particularly believing, as I do, that no published process that I have seen could possibly accomplish what I have asserted. But, should I be mistaken, I would like to have my error pointed out to me.

Now I must guard myself against being told of some one who has done as much before, and if their process be not published this will give them the first opportunity; for I have neither the time, talent, nor disposition to enter into a paper war to defend what I believe to be quite original.

As a proof of my sincerity, I am willing at once to communicate my process in strict confidence to any two or three scientific men acquainted with, but not professionally engaged in, photography; and, should they report favourably, it might sufficiently encourage those interested to appoint a committee, before which I would practically demonstrate my assertions—my only conditions being good light, in (say) July or August, as my engagements will not allow an earlier period. If, after proof, due credit be given to me, then I will give freely to the world all I know. This I will do regardless of Burns' advice—

"But still keep something to yourself,
Ye scarcely tell to any."

Nothing shall I keep to myself, but be guided by the Arab proverb—

"Speak the truth, if the heavens should fall."

LACHLAN McLACHLAN.

Stamp Office Buildings, 9, Cross Street,
Manchester, Jan. 1, 1868.

P.S.—Should my offer be considered worthy of attention, I will enter into an arrangement at any time for putting my statements to the proof; but I will not take part in any discussion, further than to explain anything that may not appear clear.—L. McL.

ON THE USE OF DISTILLED WATER.

DEAR SIR,—I have just read Mr. Cherrill's article in the current number of the *News*, entitled "Against the Use of Distilled Water," and am, from my experience, compelled to disagree with him. If I were asked to state what I considered to be one of the chief causes of three-fourths of the failures in photographic manipulations and processes, I should unhesitatingly say, the neglect of obtaining absolutely pure water; and I may add, that so far from considering distilled water unnecessary, I am compelled to conclude from historic evidence that even that of the ordinary kind is mostly unfit for the chemist's use. It will be obvious to any one, after a moment's consideration, that the water of any locality contains traces, and sometimes more than traces, of the soluble organic and inorganic matters that abound in the soil through which it has to force its way; and, although it might be possible to find some spot where the water would contain no really noxious element, photographi-

cally considered—as Mr. Cherrill, perhaps, has done—yet I cannot deem it anything short of imprudent to advise photographers generally to disregard the use of the still, and employ the water nearest at hand.

Especially in the admixture of the negative bath is the various effects of undistilled water seen; and it is certainly "like straining at a gnat and swallowing a camel," to ask and pay for pure photographic silver and other chemicals, and then mix them with the unknown impurities obtained from the town reservoir or the local pump. In my own practice I have found it to be most profitable if, on adding a few crystals of nitrate to the quantity of distilled water selected for a new bath, there be the slightest milkiness, to withhold the remainder of the silver until a newly-distilled supply be obtained, in which this addition shall make no alteration to the bright and sparkling look of the water. In every case, I believe I may say, in which I have attempted to use a sample of water showing the slightest turbidity, the bath produced has had more or less of streak, fog, or other marking and deposit as the result. Hence my earnest advice to those whose successive failures have not made my words unnecessary, is, on no account trust your silver to anything but the purest distilled water; indeed, so far do I carry out my own injunctions, that not only in bath, developer, redeveloper, and other solutions is it used, but the first washing of prints is invariably that of uncontaminated water. To do this, of course, a still and appliances were necessary; but I conclude that no outlay has been of more benefit to me in the matter of creditable pictures, few failures, and comfort in work. I quite coincide with your correspondent, that no process which depends upon "uncertain conditions of success" ought to be, to say the least, preferred. I trust he will excuse me if the foregoing seem like "a hoist with his own petard;" and I am sure that as we become more and more familiar with our work we can afford to dispense with many things once considered indispensable on the authority of the "hand-books" he mentions; and that the fluttering expectancy and hope and fear of the novice is replaced by the quiet assurance of mastery in him whose theories have been nicely balanced and judged by his daily experience.—I remain, sir, yours truly,

R. H. P.

INDIA-RUBBER MOUNTING.

SIR,—Seeing that several of your correspondents have had some difficulty in the use of the india-rubber mountant, I think it will be found that they have used the solution *too thin*: it should be of the consistency of golden syrup. The print and mount should be well coated, and the benzole allowed to evaporate thoroughly, before any attempt is made to mount the print. If the solvent has not quite evaporated before the print is pressed or rolled down, blisters will be almost certain to appear on some parts of the picture. I have used with success, for rubbing down the print, one of the globular glass-paper weights, passing it over every part of the print with considerable pressure.

I do not think the rubber mountant will ever be much used by professional photographers. It is better suited to the use of amateurs, who often keep their photographs in albums, and therefore always under a certain degree of pressure. I have given up the use of the india-rubber mountant since 1866, for on one occasion, not having time to send a series of large prints to be mounted by a professional mounter, I did them myself most carefully with india-rubber, but was much vexed at having them returned in a few days, they having blistered up from the mounts badly. I also had, until recently, in my possession some drawings which were mounted with india-rubber about the year 1850. These drawings had got loose from the cardboard, and there remained on the mounts a brown friable substance, as described in your article last week. I am, sir, yours obediently,

A PHOTOGRAPHER.

Plymouth, January 13th, 1868.

SOAP IN DRY COLLODION.

SIR,—I see in your last number that M. Carey Lea has invented another "new dry process," which consists in adding tincture of soap to Sayce's collodio-bromide of silver. I beg to state that I have used soap in collodion for dry plates for some time, having adopted it in accordance with a suggestion of your own given nearly two years ago, when you recommended the addition of Castile soap to collodion to form oleate of silver as a suitable organic silver salt for dry plates. At the same time you recommended its use in collodio-chloride of silver; but that I have never tried. I have added two grains of Castile soap (sometimes I used soft soap) to each ounce of collodion, dissolving it first in the iodizer. It did not all dissolve, but there was sufficient to make a marked difference in the sensitiveness of the collodion when used wet, and also great increase of vigour. I have got good dry plates with simple washing, without any preservative. I gave it up, however, as I fancied it made the bath give foggy plates.—Very respectfully yours,

THOMAS HARNING.

P.S.—What is an "official tincture" which Mr. Lea says he has used? And does the novelty depend upon the use of this tincture?

[An official tincture is a tincture prepared according to the instructions of a recognized pharmacopœia, and generally kept ready for use by all pharmaceutical chemists. The tincture to which Mr. Lea refers is probably one known in America, but it is less certain whether it is usually kept in this country. We have a few remarks on the subject in another page. The novelty of the process consists in employing a new combination of known substances, and one which it appears produces a good result.—En.]

EDGE'S PHOTOS.

SIR,—Seeing so many trying to solve the problem as to how the above-named photographs of portraits, with landscape backgrounds from nature, are taken, I, with your permission, will state how I think they may be done.

In the first place, take three pieces of patent plate glass, and get them finely ground at the edges until all are of one exact size. Next get a printing-frame that will open both back and front; at the back put in an ordinary hinged shutter, but leave depth enough of rabbet for thin piece of wood, round which I would double the sensitive paper, to keep it in its place; the front of the frame should be composed of a brass rabbet exactly the size of the patent plates (deep enough to take two pieces of the patent plates with spring fastenings to the four corners). So much for the printing-frame.

Now, with regard to photographing, in the first place take one of the three pieces of glass, and produce an ordinary stereo view, finished and varnished; with second glass take a portrait negative; with the third glass prepare a dry plate. When this is done, place it in the printing-frame with negative of portrait on the top, and produce a transparent positive over-exposed. In the next place, take your stereo negative, and prepare the face of it as a dry plate; when that is done, place it in the printing-frame, take your transparent positive, and print upon it negative, which will form a mask; any part that may be transparent to admit the light can be easily blotted out. Print the figure the proper depth; when that is done, remove that negative, and replace it by the stereo negative with photo mask. By this means I think the masks will exactly fit.—Yours respectfully,

A. E. SCALES.

Hartlepool, Jan. 8th, 1868.

P.S.—I also think that a thin solution of gelatine and bichromate of ammonium made very black with indian ink, and flowed over the face of landscape negatives, after being exposed under transparent positive, would make a very good mask: the shadows might be over-printed by means of a lens.

A. E. S.

[It will be seen that there is an analogy between the plan suggested here and that described in our last. It is only just to our correspondent to say that this letter was received before the publication of our last, but just too late for insertion in that number.—Ed.]

DOUBLE PRINTING AND MR. EDGE'S PICTURES.

DEAR SIR,—In the method of double printing described in your last, I am sorry that I omitted to state that it will not do to print the negatives face to face, as the mask would be reversed; but some contrivance must be used to print the dry plate on the back, through the glass.—Yours truly,

W. I. MARQUAND.

Vauvert Street, Guernsey, Jan. 11th, 1868.

[Camera printing would meet the difficulty.—Ed.]

Talk in the Studio.

M. ADAM-SALOMON.—A rumour has received some currency that M. Salomon is about to open a studio in London, having taken for the purpose the premises in Regent Street lately occupied by the United Association of Photography. We are in a position to state that there is no truth in this rumour. The premises in question have been taken by the proprietor of M. Ken's establishment in Paris. M. Salomon, as he recently stated in a letter in our columns, intends, during the coming spring, to visit London, but, in a recent letter, we are informed that the visit will, from press of business, not take place just at present. Whether his visit will be connected with any idea of opening a studio here, or not, we cannot at present state; but, in any case, he will bring with and place on view a collection of his portraits, both prints and negatives.

LITHOGRAPHIC TRANSFER PAPER.—Our contributor, "A Practical Man," sends us the following, in answer to a recent enquiry by a correspondent:—"The preparation of paper for transfer in the lithographic process is now very much simplified, amateurs and others being supplied with a peculiar kind of ink, invented and made by Haddon and Co., of George Yard, Lombard Street. It has great advantage over the old ink, which was difficult to manipulate with. This new preparation is easy of use, cheap, and quick. Any can use it, and prepare circulars, forms, or outline designs for the lithographic printer with great readiness and certainty, no prepared paper being required, any good smooth flat-faced paper answering well."

EXHIBITION OF MEDALLISTS AT THE CRYSTAL PALACE.—The directors of the Crystal Palace are inviting all persons who received medals at the Paris Exhibition to contribute the articles for which they received medals to an exhibition to be held in the Palace. Photographers who received medals, in responding to this invitation, will, in many instances, have an opportunity of improving on their Paris contributions.

MORE PIRACY.—A few days ago, at the Birmingham Police Court, a man named Robson, a wholesale photographer, carrying on business at the Green Lanes, near Birmingham, was summoned by Messrs. Graves, of London, on a charge of pirating registered photographs, the property of the complainants. Having reason to suppose that pirated copies of their photographs were being disposed of wholesale, Messrs. Graves sent a young man named Cattermole to Birmingham. He assumed the name of Milner, and, on the pretence of desiring to purchase, he got introduced to Robson, who sold him, as it was alleged, pirated copies of "The Piper and the Nutcrackers," "Ordered on Foreign Service," "The Acquittal," "The First Sermon," "The Second Sermon," "Waiting for the Verdict," and other pictures. The defence set up was that the pictures sold were photographs of engravings, not copies of the complainants' photographs. The Bench, however, were satisfied with the evidence for the prosecution, and fined the defendant £65—that is, £5 in thirteen cases—with the option of going to prison for twenty-six months.

To Correspondents.

CULLUMPTON.—As your queries require answers which may be interesting to others, we print them in full, with their answers:—
1. In making the collodion for the new dry process (soap in collodio-bromide of silver) is no gun-cotton to be used? I thought all collodion was made with that substance.—The

omission of any mention of soluble cotton in Mr. Lea's formula for collodio-bromide is doubtless an inadvertency. Add to each ounce 5 or 6 grains of cotton. The exact quantity must somewhat depend on the quality of the cotton. 2. In making a solution of india-rubber in benzole, for edging plates, &c., is any particular kind of rubber necessary? for I put 2 grains of good india-rubber into an ounce of benzole, about a week ago, and hardly any change seems to have taken place, except that the piece of rubber is larger in look and thinner—more transparent in fact.—Samples of india-rubber vary much. Old samples which have been much exposed to light become comparatively insoluble. Some samples of benzole also are bad solvents. It is wise to adopt the recommendation we have given, to macerate first in a small quantity of chloroform. 3. In using the old hypo-toning and fixing-bath, does it imply, when it says: "the solution, too, is always ready and in good working condition to receive the prints direct from the pressure-frame, without any previous washing," that it is better *not* to wash the prints before immersion, or merely that the prints need not be washed?—The custom used to prevail of immersing the print in the old toning bath of gold and hypo without washing, but we do not recommend the practice. 4. When making up the sulphocyanide of ammonium toning-bath, as soon as I put in the gold solution, a yellow-coloured precipitate was formed, and still remains at the bottom of the bottle: is this usual, and does it interfere with the toning?—The orange-coloured precipitate is sulphocyanide of gold, which is insoluble in water, but it is soluble in excess of the alkaline sulphocyanide. If you add, therefore, more of the sulphocyanide of ammonium the precipitate will be re-dissolved. Unless you re-dissolve it you waste the gold. 5. I have in my possession a carte-de-visite lens, 41-inch focus, 2 1-10th in diameter, and about 16 feet from sitter: is this a thoroughly good lens to use and keep, or ought I, to obtain perfectly good results, get one of longer focus?—A lens of longer focus is desirable for card pictures, especially for standing figures. 6. Why is it that portraits can't be, or are not, taken with a large single lens? Is it merely because it requires a longer exposure? Groups I can take well with a 3-inch Ross single lens: why not take one person? I have not tried yet except in my studio, where it was too dark.—Portraits can be taken with a single lens, but if taken with large aperture, to secure rapidity, the definition is not good; and if the aperture be reduced to get good definition, the exposure is long. You can take single figures, of course, just as well as groups, with your single lens. 7. Might I unke and copy a registered tent for myself and private use without incurring any risk of breaking patents, &c.?—Registration does not protect the design of a tent, but a patent does. If you copy a patent tent you break the law, but this is not the case with registration. 8. I have recently had a quire of albuminized paper from a surplus stock of —. I find that it prints a curious purple colour, not a brick-brown, as is usually the case: is this peculiar to some papers? I send you a piece just out of the pressure-frame; some pieces are much more purple—indeed, almost a nice tone—but the enclosed is hardly pleasant.—The colour of the untuned prints enclosed is not uncommon, and is very good; such prints generally tone well. 9. Do you know any thing of —'s albuminized paper, whether it is a good sample?—The paper of the maker whose name you mention is very good.

W. H. J. asks if any of our correspondents have tried coffee dry plates developed with iron and silver, and intensified with acid pyro and silver, and adds that he has had fair success with some plates so treated. We have not heard of cases, but shall have pleasure in recording the results of any of our readers. 2. Mr. R. Mauners Gordon considers the gun process, as described in our YEAR-BOOK, the most perfect dry process, equal in sensitiveness to any other he has tried, superior in results to most that he has tried, and superior in keeping qualities to all that he has tried. Being an ardent dry-plate experimentalist, he has got good results by many of the known processes, and has found the honey process useful for many purposes, especially where simplicity rather than keeping qualities is required; but his verdict, on examining all, is that which we have just given. The reason for his abandonment of the modification of the collodio-albumen process was its imperfect keeping properties.

R. M. D.—The YEAR-BOOK is not out of print. We have seen the prospectus to which you refer. You are right in supposing that it reaches you without our sanction. After copies of the YEAR-BOOK or NEWS leave our publishing office we have no control over them, and they may be made the means occasionally of surreptitiously conveying documents of which we have no knowledge. It is possible, as you suggest, that it is an attempt to take advantage of any little prestige belonging to the amateur publication we have recently noticed. It is purely a trade speculation, its projectors being men of no position or reputation, and whose names would carry no weight in the photographic world.

HILLERSDON.—Much depends on the colour, character, and general tone you prefer. We described the mode of toning transparencies on dry plates in an article which appeared a few weeks ago. You will also find an article on the subject in our last YEAR-BOOK. Any dry process of which you are master will answer. As a rule, the addition of acetic acid to the pyro developer will tend to the

production of a brown tone; the use of citric acid, to a bluish black tone. It not unfrequently happens that dry plates receiving full exposure have a trace of an image before development, especially if the preservative used contains a reducing agent, as in this instance.

PHOTOGRAPHER.—If you have any reason to suppose that any trace of a gold salt remains in solution, you may, instead of pouring away the solution, add chloride of lime to it, taking care to add sufficient nitric acid to give an acid reaction. This will combine with the lime, and liberate the chlorine and hypochlorous acid. The chlorine will combine with the gold in a fine state of subdivision, and also with any oxide of gold which may be in solution. A solution of hypochlorite of lime is made by adding common bleaching powder to water, shaking, and then filtering. You obtain in the water chlorine and hypochlorite of lime, and leave a residue of hydrate of lime. A gentle heat will promote the solution of the gold, and the hypochlorite solution is to be added, a little at a time, until all is dissolved. The subsequent boiling is to get rid of excess of chlorine. In a toning bath made with carbonate of soda, the bath often becomes inert before the gold is thrown down, a little oxide of gold remaining in solution, which is eventually thrown down as metallic gold. We do not quite understand what you mean by the spongy precipitate formed in mixing a neutral silver bath. There should be no precipitate at all. We cannot recommend special lenses by name in this column. If you will make a list of the lenses you contemplate selecting from, distinguishing each by a figure or a letter, we will give you our opinion as to which is most suitable to your purpose.

A FIVE YEARS' SUBSCRIBER.—Professor Fowler is an American gentleman contributing to American journals. We generally reprint such of his articles as appear likely to interest our readers, but we have no knowledge of the subjects upon which he will write, and when. We have published all that we know he has written on the subjects you name.

O. F. OTTO.—A minim in fluids is equivalent to a grain in solids, 480 minims forming one measured ounce. As a somewhat rough rule, minims and drops have been regarded as sufficiently equivalent to be used in many cases. The rule is, however, obviously very unsafe, as drops of different fluids vary considerably, not only in weight, but in volume. A drachm-glass measure is generally graduated for minims.

J. H. S. STANLEY (Texas).—There are various modes of producing the effects to which you refer, but the following method will, when well-managed, give exceedingly fine effects, closely resembling ivory painting. Take a perfect print of somewhat warm tone, clean, sharp, and not too deeply printed, but still sufficiently made out. Instead of mounting on board, stretch the print on a frame made by cutting out a piece of millboard, attaching the print at the edges, colour in water colours, using all the tints considerably more vivid than is required in the finished picture. When completed, melt a little white wax or paraffine, and apply it at the back of the picture, using just sufficient to make it semi-transparent and no more. A piece of pure white paper, or cream-coloured paper, is then placed at the back of the print, which very closely resembles an ivory miniature. A few touches of high light may be put in body colour on the face with advantage.

HENRY H. HELE.—Elementary works on art suitable for photographers are not very plentiful. One of the simplest and cheapest we know is Howard's Sketcher's Manual, published by Darton and Co., at about 5s., we believe; but we fear it is out of print. Burnet on Composition is a capital book, but a little expensive, the price being 15s.; published by Leighton, Brewer Street, W. But to acquire a satisfactory knowledge of the art principles which govern pictorial effect, especially as possible in photography, requires the study of many books, and much study. We have had for some time in preparation a series of lessons on the principles of art as applied to photography, contributed by more than one of the most celebrated artists associated with photography. These will commence in our pages very shortly. "Leaf Prints," by Professor Himes, has no publisher in this country, but could, doubtless, be ordered by your bookseller through a London house.

R. H. P.—The article on M. Salomon's studio and manipulations will appear in our next. Of course the addition of sugar to the printing bath would nullify the value of an argometer based on the specific gravity of the solution. We saw the groups of which you speak, by M. Angerer, in the Exhibition, and noted the excellence. We rather infer the skill of the artist, however, than any special quality of the lenses employed, inasmuch as whilst the lenses are accessible to all, the excellent groups are only produced by one or two artists. Further, M. Angerer, to our knowledge, employs for much of his work the lenses of one of our best London opticians. For the groups, we have no doubt that lenses of long focus are used, and the figures are admirably arranged to suit the exigencies of the lens. Doubtless the light at Passy is excellent. The card enclosed is very rich and brilliant.

JAMES INGLIS.—The cards and cabinets duly received. Thanks. We shall notice them shortly.

RECEIVED.—"Monckhoven's Photographic Optics."

Several articles in type and completed stand over until our next. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Enlarging by the Magnesium Light	37
Important Copyright Case	37
The late C. Thurston Thompson	33
An Art Critic on the Touching and Lighting of M. Salomon's Portraits	33
Pictorial Effect in Photography	40
Faraday as a Discoverer	41
Cyanide of Silver in Collodion	41
A Simple Method of Double Printing. By Walter Woodbury ..	42

	PA
Visits to Noteworthy Studios	42
Photography as a Profession. By S. Thompson	44
Ennel's Hints	45
Correspondence—Hyposulphite of Ammonia for Fixing—India-Rubber for Mounting: Distilled Water—The Discovery—Carbonate of Ammonia in the Fixing Bath	46
Talk in the Studio	47
To Correspondents	47

ENLARGING BY THE MAGNESIUM LIGHT.

MR. SOLOMON has recently called our attention to his apparatus for producing enlargements by means of the magnesium light, and given us an opportunity of witnessing its practical application, the results of which, we must confess, decidedly exceeded our anticipations. From the experiments we have witnessed it appears that nothing can be more simple, certain, successful, or economical, than the operation of producing enlargements by the appliances thus provided.

The instrument employed in the experiments at which we were present is the smallest provided for this purpose. It consisted of a camera with a portrait lens for enlarging, of about four inches focus; behind this a groove for holding the negative to be enlarged; and behind again, a magic-lantern condenser, the combination consisting of a double convex and a meniscus lens, the combined focus being three inches and a half. The magnesium lamp, with a clock-work arrangement, to maintain a steady delivery of the wire or ribbon for three minutes, is attached to the back of the camera, the ribbon passing through a tube into a wide metal tube or chimney inside the camera; an opening in the tube, the back of which serves to some extent as a reflector, permits the light to reach the condenser. The chimney projects beyond the camera, and a tin pipe serves as a flue to conduct any smoke into the open air. The whole arrangement is compact, neat, and easy to manage.

The first picture we saw produced was from a card negative, the head and bust of which were enlarged to fill a whole sheet of photographic paper, the amount of enlargement, estimating without actual measurement, being about ten diameters. The mode of preparing the paper, which was used nearly dry, was an experiment, and it was not anticipated that the exposure would be short. A single piece of ribbon was burnt for about two or three minutes, and the image, a faint indication of which was visible, was then developed with gallic acid containing acetic acid. A very good picture was obtained, with a trace of under-exposure, but fully equalling the average of solar camera pictures we have seen.

In the next experiment all the conditions were well defined, and the results very perfect. The paper was salted by floating on a solution containing 15 grains of iodide of potassium and 5 grains of bromide of ammonium in an ounce of water. The silver bath contained 60 grains of nitrate of silver and 10 minims of acetic acid to each ounce of water, and the paper was used immediately after floating on this bath, and whilst it was still wet. The amount of enlargement was about six diameters; that is, the head, in the negative of which the head and bust were produced was about half an inch long, was enlarged to about three inches long. The exposure was exactly thirty-five seconds, with

the light from one piece of ribbon. No trace of the picture was necessary in the process; but on applying a hot solution of gallic acid the image rapidly appeared, and, after about three minutes' development, was fully out, at once soft, round, and vigorous, clean in the lights, and deep in the blacks, and an exceedingly good enlargement was produced.

The ribbon used in these experiments runs about fifty yards to an ounce of magnesium, one yard burning for three minutes. Thus, at twelve shillings and sixpence per ounce, each minute's light cost one penny. A small portion of the ribbon is burnt in illuminating the negative during the process of focussing; but this, together with the exposure on the sensitive paper, did not exceed one minute, so that in this instance the cost of the light for an enlargement of about six diameters was about one penny. For an enlargement to life-size, which, as a rule would be effected from a negative not requiring more than an enlargement of ten diameters, the combustion of wire would probably not exceed one yard, costing threepence.

The results produced, so far as the light was concerned, leave little to be desired. A certain degree of unsteadiness and flickering, which belong to the magnesium light, at times produced much less difficulty than we had anticipated, only serving to make exposure a little uncertain, and requiring the exercise of judgment in the operator, much the same as exposure in a landscape, with rapid alternations of sunshine and diffused light.

We were, as we have said, altogether unprepared for such a degree of excellence, and at such a comparative economy in the cost of light. This method of enlarging is well worthy of the attention of all whose wants will be met by means of development printing.

IMPORTANT COPYRIGHT CASE.

A RECENT decision of the Lord Chancellor in a case of photographic copyright brought before the Court, is most important and interesting to photographers and all interested in the publication of works of fine art. The number of singular decisions which have been given by police magistrates where, in accordance with the provisions of the statute, a remedy has been sought against piracy by summary process, and the indisposition which has been manifested on many such occasions to recognize copyright in a photograph, has led many photographers to regard the Act of 1862, so far as it concerned their art, as little better than a dead letter. In a suit instituted in a higher Court it is refreshing to find an entire absence of the petty feeling which seems to have governed the decisions in many of the cases to which we have referred, and in its place a straightforward administration of the law in accordance with the evidence brought forward.

The reports of the daily press of the case to which we refer—*Strahan v. Graham*—have already appeared in our pages. We have recently been favoured with a perusal of the short-hand writer's notes of the case, and as the recent decision of the Lord Chancellor for the first time strictly defines and authoritatively lays down the law of fine arts copyright, we shall now lay before our readers such a statement of the facts and the decision as will clearly set forth the position of photographers in relation to copyright in their works, and in relation to any assignment of such copyright to others for publication, either of the pictures themselves, or copies of them produced by any process.

COURT OF CHANCERY, DEC. 20, 1867.

(Before the LORD CHANCELLOR.)

STRAHAN v. GRAHAM.

This was an appeal by Mr. Strahan against the judgment, in February last, of Vice-Chancellor Sir R. Malins. On the 20th ult., after two days' hearing, the Lord Chancellor affirmed the decree of the Vice-Chancellor, and dismissed the bill with costs.

In November, 1864, Dr. MacLeod, the editor, and Mr. Strahan, the publisher, of "Good Words," purchased from the defendant, Mr. Graham, for the purpose of illustrating in "Good Words" Dr. MacLeod's *Travels in the East*, some of the photographs taken by the defendant in the Holy Land. In making this agreement, which was verbal, the defendant reserved to himself the copyright of these views, and the right of publishing them as photographs, or otherwise, in any other publication. At settling in August, 1865, the defendant refused to sign the receipt as prepared by Mr. Strahan, which was "for the photographs used in 'Good Words,' but signed the receipt on its being altered to "for the use of photographs in 'Good Words,' as per account rendered, (defendant) reserving all rights to issue the same, either as photographs, engravings, &c., in any other publication."

On 31st January, 1866, Mr. Strahan published Dr. MacLeod's "Eastward" as a fourteen shilling volume, containing the same illustrations from the defendant's photographs as had appeared in "Good Words," 1865. Thereupon an action was instituted by Mr. Graham in the Court of Queen's Bench against Mr. Strahan, suing for damages, and for an injunction to restrain the sale of the book. N.L. It was to stay that action, and to compel the defendant to grant Mr. Strahan a licence to use his engravings of the defendant's photographs for any purpose he chose, that the Bill of Complaint was filed by Mr. Strahan.

On 18th and 19th February, 1867, this Bill was discussed before Vice-Chancellor Sir R. Malins, and dismissed with costs. Thus the licence craved was not granted, and the sale of the book was restrained.

Mr. Strahan appealed to the Lord Chancellor. On the 19th and 20th ult. the case was heard, and, at the close of the arguments, the Lord Chancellor affirmed the judgment of the Vice-Chancellor, with costs.

It is therefore now ruled—

That the copyright of any photograph or other work of art remains in the artist, or author of such work of art, in so far as he does not part with the same.

That the blocks from which wood engravings are printed do not carry the copyright of these engravings; in the same way as the types or stereotype plates from which a book is printed do not carry the copyright of a literary work.

That every sale of arts copyright, or licence of user, must be in writing, and cannot be construed to extend further than is expressed in that writing.

It may be important here to remark that the copyright of any photograph, or other work of art, only vests in the author or producer in cases where the picture has been produced by the artist for himself, and not as a commission for which a definite consideration is paid. The professional photographer, in taking a portrait or view to order, does not acquire a copyright in such photograph unless he reserve it

by a memorandum in writing, signed by both parties, to the contract at the time. But any portrait or view taken by the photographer by his own choice secures, on registration, an absolute copyright in the photograph, of which he cannot be deprived by any sale of copies, or of a limited right to copy for any specific purpose, except by an assignment made in writing. On this point the judgment of Vice-Chancellor Malins was very specific, observing that if Mr. Strahan had "proved a verbal contract, the objection would have been as fatal here (in the Court of Chancery) as at common law; that the statute requires to be in writing."

Another point of interest to our readers, of a non-legal character, is worth observing, as illustrating the value of the copyright in good photographs. Under the contract with Mr. Graham Mr. Strahan bought the right to engrave seventy or eighty photographs for use in "Good Words," only at the rate of three guineas each; and rights to copy the same photographs for other works had also been sold to Mr. Murray, to Mr. Longman, Mr. Bentley, and Mr. Day. The photographs were very fine and rare ones, and the price was reasonable; but amid the general prevalence of a tendency to produce photographs at disgracefully low prices, it is pleasant to contemplate cases in which examples of photography are regarded as works of art, and are valued in such a spirit in the market.

THE LATE C. THURSTON THOMPSON.

It is with very deep regret that we chronicle the loss to the ranks of professional photography of another of its distinguished ornaments, and a very estimable gentleman. Mr. C. Thurston Thompson died on the 20th instant, at Paris, after considerable suffering. He had been out of health for some time, gall-stones, causing jaundice, being the final form of illness.

Mr. Thompson was the son of the well-known wood-engraver, Mr. John Thompson, whose name is associated with much very excellent work, and especially with the engraving of Mulready's design for the first penny postage envelope. Mr. Thurston Thompson was brought up to his father's profession; but early in the history of collodion photography he became a pupil of Mr. Bingham's, of Paris, and has in subsequent years devoted himself largely to the same class of work as Mr. Bingham. As a photographer, Mr. Thompson had, in his especial vocation of reproducing works of fine art, very few equals, his refined taste and extensive knowledge of art peculiarly fitting him for the duties which, as photographer to the Department of Science and Art at South Kensington, for many years devolved upon him. His photographs, recently produced, of historical architecture of Spain, also for the Department, are amongst the choicest examples of architectural photography in existence.

Mr. Thompson was a man of extensive and varied art culture, possessing a most discriminating taste and judgment; but, withal, modest and unassuming. As a private friend he was a rarely amiable man, possessing an unusually winning and conciliatory deportment. He was for many years a member of the Council of the Photographic Society, where, when at home, he was found in regular attendance. His residence for some time in Spain and Paris, during the last year or two, has caused his absence from the deliberations of the Council for some time, an absence always regretted, and which it will cause a deep sorrow in all his colleagues to know will never now be broken. He died in the full prime of life, his age, we believe, little exceeding forty years.

AN ART CRITIC ON THE TOUCHING AND LIGHTING OF M. SALOMON'S PORTRAITS.

THE Art Critic of the *Illustrated London News*, a gentleman whose sound remarks on art and intelligent appreciative comments on photography we always read with pleasure, has

some recent remarks on the subject of the touching and the lighting of M. Salomon's portraits which, as our statements on the subject are referred to, demand from us a few words of explanation. We will quote the paragraph in its entirety, so far as it relates to the question of touching. Our contemporary says:—

We are informed that M. Adam-Salomon, of Paris, who, it is generally conceded, is the best portrait photographer in Europe, intends shortly to visit this country, bringing with him examples of his art. Apropos of this announcement, we remark that a controversy as to whether the portraits by M. Salomon in the last exhibition of the Photographic Society were or were not "touched" has been maintained with some animation. It may be remembered that, in reviewing these marvellously beautiful works, we expressed ourselves morally certain that several of them had been touched, some of them extensively; and we did so notwithstanding that the PHOTOGRAPHIC NEWS had expressed itself convinced, after minute scrutiny of negatives and prints in Paris, that both "were alike guiltless of any touch whatever from the pencil of the artist." At the same time, we were careful to insist, lest British photographers should delude themselves by attempting to extenuate their defeat, that the essential merits of M. Salomon's productions were independent of adventitious aid from the pencil. Our opinion on the question of after-touching has been confirmed in many quarters; and even the PHOTOGRAPHIC NEWS says, in a subsequent number, "there is in many prints the retouching common amongst all photographers, such as the strengthening of the iris or pupil of an eye, &c.; on some there is here and there a boldly-hatched line, to give force or form to some portion. . . . Individual parts—such as an eye, a hand, or a lock of hair—have been often improved by clever touches." Now, we had always understood that the only admittedly legitimate "retouching" common amongst all photographers "was merely stippling out accidental spots or blemishes; but that any tampering with 'individual parts,' to give 'force or form,' was deemed highly objectionable, as diminishing the accuracy, and therefore the, so to speak, documentary value of the pure photograph. Moreover, as the PHOTOGRAPHIC NEWS now acknowledges that many parts have been "improved" (?), may not an eye familiar with every recourse of water-colour painting detect that more extensive blending of the gradations in the flesh which we believe to exist in several of the exhibited specimens? After all, however, where the retouching is so exquisitely artistic, it might almost appear as justifiable, regarded solely from the artistic point of view; and in any case we are quite prepared to believe that some of M. Salomon's finest works are virtually untouched.

Our contemporary—we are satisfied, unintentionally—somewhat mistakes the tenor of our remarks upon M. Salomon's portraits. In speaking of individual pictures, and these often the best, we have said that they were guiltless of any touch from the pencil of the artist; but speaking of M. Salomon's pictures as a whole, we have said and repeatedly reiterated, that some of them were considerably touched, some a little touched, and some quite untouched. We unhesitatingly agree with our contemporary, not only that, in some cases, there is the bold and indisputable touch which removes some fault or gives force to some beauty, but that there is also, in some cases, "the more extended blending of the gradations of the flesh" of which he speaks. We have said more: we have expressed our conviction that M. Salomon was too much imbued with the feeling of an artist to neglect the application of the pencil in any case where he could remove a fault or add a beauty to his pictures. The point upon which we have insisted is just that in which we are confirmed, and is so well expressed by our contemporary, that "the essential merits of M. Salomon's productions were independent of adventitious aid from the pencil." We have aimed constantly to impress upon photographers the fact that it was to art knowledge applied photographically that the excellence of the pictures was due; that art knowledge and artistic feeling in the pose, arrangement, and lighting, rather than in the application of the pencil, were the sources of superiority. We felt it necessary to insist upon this because it was tolerably freely rumoured amongst photographers that the photographs themselves were entirely overlaid by the pigments of the miniature painter; and that, therefore, they did not enter the lists honestly when they competed with photography proper. As such an impression was unfair in itself, and mischievous in its operation, because it deprived English photographers of the valuable lesson

that they had a higher excellence to attain by means legitimate to their art, we have persistently insisted on the fact that the pictorial value of the portraits was not due to retouching, and that where it was employed it was only used to supplement photography, not to overlay or supersede it; and having seen both negatives and prints in every stage of their production, we were able to do this with some show of authority for our statements.

On the question of the legitimacy of "improving" a photograph by retouching, opinion amongst photographers has undergone considerable change of late years, and the fanatical faith in the photograph pure and simple has undergone much modification. The oldest photographers, both in landscape and portraiture, do not hesitate to apply the pencil to either negative or print to remove a blemish or give additional force to a fine point in a picture. The only conditions necessary in adding such supplemental touches are honesty and skill to avoid the falsification of nature or the violation of artistic truth; and success in improving his picture within these conditions is the touchstone of the legitimacy of the operation.

On the subject of the mode of lighting, our contemporary made some remarks, in his criticism of M. Salomon's pictures at the late exhibition in Conduit Street, to the effect that they were manifestly produced by means of a light from a confined source. In regard to many of the pictures this statement is indisputably true; the strong cast shadows present in many of them were evidence of this. In a "Lesson Learned in Paris, by a London Photographer," the writer, describing what he saw in M. Salomon's studio, expresses his conviction that he did not work with a concentrated or confined light. Noticing this, our contemporary says:—

The writer in question says that, contrary to our opinion, M. Salomon does not employ a confined area of light; and yet, forthwith, the writer proceeds to prove that we were perfectly right in our conjecture. He says that M. Salomon "carefully kept all the light in one direction (for he has carefully excluded it on one side, up to the ridge of his roof). . . . He has stippled down completely the violence of the top-light." Further on, the superior results of the foreign portraits are attributed to the Continental photographer's superiority in the management of lighting. And, again, the writer adds, "the superior rendering of light textures is due, I feel assured, to their superior light, which enables them completely to moderate the intensity of the top-light, and to employ the pure light from the side, and only sufficient of it to produce those masterly touches of brightness we all so much admire." It is evident from this that M. Salomon resorts to various expedients to subdue all light relatively to the ray he wishes to be paramount; ergo, may it not be said, without fear of misconception, he works with a confined light? Otherwise, he could never secure the effects we all admire. So much, as an artist, M. Salomon well knows; so much is absolutely certain from, as we before remarked, the definition of the cast shadows in his portraits. Once having secured a principal and comparatively confined light, it is of course for photographers to decide what further area of light, provided always it be of secondary intensity, may be necessary for their operations.

In this matter both gentlemen are right. M. Salomon unquestionably frequently works with a concentrated light, or a light from a confined area. His principal light is a high side-light. This is obtained through the only clear glass in his studio, the space it occupies being twelve by six superficial feet; as much of one-half of which is frequently covered by blinds. The only skylight possesses about double that area of glass, the whole of which is obscured by stippling with white paint, and a portion of the soft light admitted by this is occasionally cut off by blinds. When the "London Photographer" saw the studio, it was in November, and, as may be naturally supposed, the area of light admitted was less limited than usual, and the pictures produced at the time, whilst in nowise inferior in excellence, were not distinguished by the brilliant contrasts of light and shade present in some of M. Salomon's portraits. Nevertheless, the "London Photographer," who described his own experiences, is one of the ablest and most conscientious exponents of our art; and the difference between him and our contemporary is one rather of words than facts.

A word on another subject, and we are done. The Art Critic of our contemporary calls attention, "for the sake of literary fairness," to certain garbled quotations from his former remarks, made by the "London Photographer" in question. He says:—"For example, we spoke of *spotty lights*, not frothy lights; we spoke of the light an artist chooses for his studio, not for his shades (!)" We hope it is scarcely necessary to assure our contemporary that the errors in question are either clerical or printer's errors, most probably the latter. Our contributor is utterly incapable of the meanness of an intentional misquotation, which would here, moreover, be not more mean than purposeless and foolish.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

INTRODUCTORY REMARKS.

"All arts having the same general end, which is to please; and addressing themselves to the same faculties through the medium of the senses; it follows that their rules and principles must have as great affinity as the different materials and the different organs or vehicles by which they pass to the mind, will permit them to retain."

"As our art is not a divine gift, so neither is it a mechanical trade. Its foundations are laid in solid science; and practice, though essential to perfection, can never attain to that which it aims unless it works under the direction of principle."

"Every opportunity should be taken to discountenance that false and vulgar opinion that rules are the fetters of genius; they are fetters only to men of no genius; as that armour which, upon the strong, is an armament and a defence, upon the weak and mis-shapen become a load, and cripples the body which it was made to protect."

"It must of necessity be that even works of genius, like every other effect, as they must have their cause, must likewise have their rules; it cannot be by chance that excellences are produced with any constancy or any certainty; for this is not the nature of chance."—*Discourses of Sir Joshua Reynolds.*

"In a word, every art, from reasoning to riding and rowing, is learned by assiduous practice; and if principles do any good, it is proportioned to the readiness with which they can be converted into rules, and the patient constancy with which they are applied in all our attempts at excellence."—*Dr. Thompson's Outlines of the Laws of Thought.*

It has often been asserted that the artist, like the poet, is born, not made; and, within certain limits, the assertion is doubtless true: without a natural capacity for pictorial perception no study and no amount of industry would produce an artist. "Patience and sandpaper," Ruskin remarks, "will not make a picture." But, no matter how great the natural capacity, or how undoubted the genius, certainty in excellence, and permanent success, cannot be attained without a knowledge of the rules and a study of the principles upon which pictorial effect depends. No mistake is more fatal than a reliance upon genius instead of effort, upon "inborn taste" instead of culture and the application of recognized and certain laws.

It has been often alleged, that except in its lowest phases, and in its most limited degree, art can have nothing in common with photography, inasmuch as the latter must deal with nature, either in landscape or portraiture, only in its most literal forms; whilst the essential province of art is to deal with nature in its ideal forms, rendering that which it suggests as well as that which it presents, refining that which is vulgar, avoiding that which is common-place, or transfiguring and glorifying it by poetic treatment. Photography, it has been said, can but produce the aspects of nature as they are; and "nature does not compose: her beautiful arrangements are but accidental combinations." But it may be answered, that it is only the educated eye of one familiar with the laws upon which pictorial effect depend who can discover in nature these accidental beauties, and ascertain in what they consist. Burnett observes, "Nature unveils herself only to him who can penetrate her sacred haunts. The enquiry, 'What is beautiful, and why?' can only be answered by him who has often asked the question." The same writer, speaking of Turner's early efforts, describes them as something like very common-place photographs; they were water-colour landscapes, "aspiring only to topographical correctness, the unadorned represen-

tations of individual scenes." It was only subsequent study, and a higher knowledge of the resources of art, which "gave him a hint that selection of a situation, and clothing it with effective light and shade, ennobled the picture and placed it more in the rank of a composition than a plain transcript." The same is equally true of portraiture. Although likeness is the quality of first importance, artistic arrangement is scarcely second to it. In some cases, indeed, art-excellence possesses a wider and a more permanent value than mere verisimilitude. The portraits by Titian, or Velasquez, or Reynolds, live rather as pictures than as likenesses, and the Gervartius of Vandyke excites the admiration of thousands who scarcely bestow a thought on the identity of the original. Art-culture, however, materially aids in securing likeness by teaching the eye rapidly to seize the salient features, to determine the most suitable view, and to arrange the light so as to bring out the effect of character: at the same time giving force and prominence to natural advantages, and concealing or subduing natural defects.

It is unnecessary however, to enforce here the value of art culture and the advantages of a study of such part of art as can be reduced to rule and law, or stated in broad principles. A growing appreciation of the importance of the subject exists amongst photographers, and an increasing desire to be put in possession of the means of studying pictorial science. The enquiry has constantly been reaching us of late, "How shall we begin to study art? Where shall we find instructions?" Of course it was easy to give the answer that the same sources of information, the same aids to study, were open to the photographer which were available to the painter. But this scarcely meets the case: the training in drawing and other elementary portions of the painter's art brings with it a gradual familiarity with higher art study, whilst the chemical and mechanical nature of the photographer's technical training does not necessarily bring him into contact with pictorial effects. Schools of art, academy lectures, &c., do not exist for him. Works on art of course there are, and many of them very excellent aids to the student; but they are all written with a direct reference to other modes of expression or application than those possible to the photographer, whose tools and materials are less plastic than any hitherto familiar to the artist.

In photographic literature there has been much fragmentary treatment of art, and some of it by blind leaders of the blind. In an excellent paper once read before the Photographic Society of Scotland, a writer once well remarked on this subject, "Loose talk about art has never been a very scarce commodity, I am afraid; but it has certainly always been a mischievous one." There has been talk enough about the mysteries of art, and no lack of rhapsodies on aesthetics and the poetry of pictorial expression; but no systematic teaching of what may be termed the mechanical bases on which pictorial effect must be built. Poetry there is in art, and mystery also; but it is little use prating of these to one who has not learned its alphabet. Instinctive perception of fitness and proportion will sometimes materially aid the artist in producing pictures, no matter what the tools by which they are produced; but no steady or progressive success can be hoped for that is not based on knowledge. The grammar of art must be learned before the student can expect to succeed in composition.

We wish here to speak very soberly; let us not be misunderstood in thus speaking of art and of its application to photography. We here make no extravagant claims for photography. We know well how necessarily limited is its range compared to painting; but we also know, within its range, how perfect are its delineations when guided by the trained hand and cultivated brain. We know its power in pictorial expression from the many wondrously beautiful things it has given to the world; and we feel assured that when a sound knowledge of art principles shall be more extensively applied, its powers will be developed, producing still more varied forms of beauty. Nor do we overrate what of art can be taught. Much of art which can be acquired by study

cannot well be taught in books. Yet much may be taught by explanation of rules and elementary principles, and by examples of the application of these rules and principles.

This is what we propose to do for our readers. Some years ago a very excellent series of papers on composition and chiaroscuro, by Mr. Lake Price, appeared in these pages. Admirable, so far as they went, we have since discovered that, for many photographers, they scarcely went far enough, lacking something of the photographic application necessary to give lessons their full value to photographic students. The material for a more extensive series of lessons, and of more especially photographic suggestion, has been for some time in preparation, contributions and suggestions for such a series having been offered by various of the ablest exponents of the art capacity of photography. Feeling that these lessons would acquire much additional value by being re-cast throughout by a gentleman whose education as a painter, and whose reputation and successful practice as an art photographer, would give weight and authority to his teachings, and by the original suggestion which such practice brings with it, we have induced Mr. H. P. Robinson to undertake the task of preparing the series of papers on art which we have for some time promised our readers. He will take the accumulated materials from published and unpublished sources, and, bringing to bear his extensive practical knowledge of what belonging to pictorial effect is possible in photography, and how it may be best compassed, we believe we can promise our readers that which has been so long a desideratum—an essentially practical series of lessons in art as applicable in photography. The series will be illustrated by examples, selected either from the works of painters or photographers, and will be produced by wood-engraving, photo-engraving, or any other process which shall be found best fitted for illustrating the purpose immediately in hand. The lessons will be commenced in our next.

FARADAY AS A DISCOVERER.

On Friday evening last, Dr. Tyndall delivered the first of two lectures upon the above subject to a very crowded and distinguished audience, at the Royal Institution in Albemarle Street. From the position occupied by Dr. Tyndall as brother professor at the Institution, and from his very intimate connection with Faraday during the later years of that philosopher's life, no better or more suitable lecturer could have been chosen to do justice to the subject.

The learned doctor prefaced his remarks by stating that, as the memoir he had prepared was a somewhat lengthy one, and it would be impossible for him to read the whole of it in the two hours allotted to him for the task, he should be compelled to omit some considerable portion of it; the whole would, however, be printed and placed in the hands of the members in a short time.

On Faraday's parentage the lecturer touched but slightly, merely mentioning that he was decidedly of Carlyle's opinion that a really able man was never born of stupid parents. He told the story of Faraday's apprenticeship to a book-binder, of his attending the lectures at the Royal Institution, of his making notes of these lectures and sending them to Sir Humphrey Davy, requesting employment in the laboratory of the Institution, of his engagement by Sir Humphrey, and subsequent promotion to be assistant in the laboratory; of his constant and unwearied investigations into the science of electricity, ending, in 1831, in his wonderful discovery that an electric spark could be produced from a magnet.

In later years, when Faraday had arrived at the zenith of his fame, when he had followed up one discovery by another, and had achieved a series of the most glorious successes, the great man still liked to look back upon his earlier life, and delighted to visit the little workshop where, once upon a time, he toiled as a poor bookbinder's apprentice. Although naturally of a sweet and gentle disposition, Faraday's character was by no means of a quiet and inexcitable nature,

for his mind sometimes displayed an extraordinary amount of fire and energy, qualifications which were put to good use in the prosecution and elaboration of his laborious researches. After his triumphant discovery of the possibility of deriving electricity from magnetism,—a discovery at present applied to many of our telegraph systems and to the production of the electric light,—Faraday turned his attention to the voltaic pile, and commenced a series of investigations producing results the novelty and unexpected character of which excited great interest in the scientific world; pursuing his studies further, he sought to simplify the terms and symbols used in connection with electricity, and to lay down the theories deduced from his numerous experiments. Turning next to the subject of gravitation and cohesion, he occupied himself with investigating and following up the ideas of Newton, and in this branch of science he was not less successful in arriving at important results than heretofore. In the year 1840 Faraday's health, which for many years had not been good, broke down completely, and he was compelled to seek relaxation from his labours in a visit to Switzerland; in that country he resided for several months, and his diary kept during that period shows how pleasantly he passed his time, and how delighted the great yet simple philosopher felt when surrounded by the grandeur of the Alps. The results of the researches undertaken by Faraday on his return to England will form the subject of the lecture this (Friday) evening.

CYANIDE OF SILVER IN COLLODION.

MR. BELL, Photographer to the Army Medical Museum in the United States, communicates to our contemporary, the *Philadelphia Photographer*, his plan of using cyanide of silver to collodion for the double purpose of preserving it and preventing pinholes in the negatives, having used it long enough, he states, to be certain of its value for the purposes indicated. His method of working is as follows:—

“Dissolve in 2 ounces of water 100 grains of cyanide of potassium; add to it a solution of nitrate of silver, 50 grains strong, until precipitation ceases; pour the precipitate into a filter, and wash well with water by percolation. Dry and bottle for use.

COLLODION.

Ether	...	...	...	16 ounces
Alcohol	...	...	...	16 "
Iodide of ammonium	...	...	...	160 grains
Bromide of sodium	...	...	...	64 "
Cyanide of silver	...	...	...	5 "
Gun-cotton (Pary's)	...	...	...	192 "

MODE OF PREPARATION—No. 1.

Take 8 ounces of the alcohol, dissolve in it 60 grains of the iodide of ammonium, add the cotton, shake well, then add the 16 ounces of ether, and shake until all are dissolved.

No. 2.

“Into a mortar put the 64 grains of bromide of sodium, adding just enough water to dissolve it; then put in the 5 grains of cyanide of silver, granulate well together; add the 100 grains of iodide of ammonium, granulate, and finally add the 8 ounces of alcohol, granulate for ten minutes, then filter the solution into No. 1.

NITRATE BATH.

“Forty grains of silver to the ounce, acidulated with nitric acid.

“The developer I prefer is Anthony's, with a little modification:—

Water	...	...	...	52 ounces
Protosulphate of iron	...	...	...	3 "

Dissolve and add, drop by drop, a 10-grain solution of tannin in alcohol, until the iron solution is quite blue now add acetic acid 3 ounces, and 1 ounce of the gelatine syrup, and copper solution. Filter, and it is ready for use.”

Should the nitrate bath be old, the acetic acid must be increased until the developer flows smoothly. With a fresh nitrate bath make no change, as it is all one could wish.

GELATINE, SYRUP, AND COPPER SOLUTION.

Water	...	...	...	8 ounces
Gelatine	...	...	...	16 grains
Golden syrup	...	...	...	1 ounce.

Dissolve by heat, then add 1 ounce of acetic acid; saturate the whole with oxide of copper, made by precipitating a solution of nitrate of copper with a solution of caustic potash, washing and drying the precipitate."

A SIMPLE METHOD OF DOUBLE PRINTING.

BY WALTER WOODBURY.

SINCE attention has been called to the fact that very fine composition pictures may be obtained on card negatives, by the beautiful pictures lately produced by Mr. Edge, of Preston, allow me to lay before your readers a plan which I adopted some years ago, in Java, for producing the same result, by which very good effects may be obtained.

The negative of the figure, with the leaves, stones, or whatever may be used to form the foreground, should have the background carefully filled in with an opaque black; and from the negative in this state a transparency must be printed on a thin film of mica, by any known dry process, which may be done by damping the mica and placing it on a sheet of glass and preparing it as in the ordinary way, but giving such an exposure and development as will give a very strong black image, which may be gone over without much care, with an opaque material. The negative is then printed, giving, of course, a perfectly white ground. The talc mask may then be carefully placed so as to cover exactly the part already exposed, and the background negative then printed in; if this is carefully done it is impossible to detect any joint in the composition. The background should be lightly printed from a weak negative, but full of half-tone, and may in some cases be improved by allowing the light to fall on it after removal of the negative.

VISITS TO NOTEWORTHY STUDIOS.

WE have often endeavoured to impress upon our readers our conviction that success in photography depended rather upon the man than the method of working; upon the amount of knowledge and culture possessed by the photographer, rather than upon the process he selected or the material appliances he employed. Nevertheless, it may be safely affirmed, as a pendant to the first proposition, that the method selected "oft proclaims the man;" being, as it is, the result of his knowledge and culture. An acquaintance with the methods employed by eminent photographers is, then, of the utmost value, not simply as instruction, but as instruction commended by the prestige of success, and as example possessing the stamp of authority.

We propose, therefore, to bring before our readers a series of papers on the mode of working employed by men who have distinguished themselves in various branches of our art-science, either by their artistic, scientific, mechanical, or commercial success. We shall describe their studios, their processes, and their operations; their modes of working, the places in which they work, and the results they produce. We have already accumulated much material for these sketches, and shall avail ourselves of every opportunity of visiting noteworthy studios in which we may find matter of instruction or interest for our readers. And as we have the good fortune to possess the acquaintance or friendship of the majority of the most able and the most successful photographers, a class we have ever found least reticent and most ready to communicate the results of their experience for the benefit of their brethren or the advancement of the art, our

readers may rely on obtaining in this series of papers a faithful epitome of the practice of those who, by excellence, have acquired distinction and success, and an indication of at least the material elements which have conduced to that success. Turning in a direction in which public interest has travelled much during the last few months, we shall commence with

THE STUDIO OF M. ADAM-SALOMON.

M. Salomon's studio is pleasantly situated at Passy, a suburb of Paris, in the neighbourhood of the *Bois de Boulogne*. After an agreeable drive through the *Champs Elysées*, passing under the *Arc de Triomphe*, and trending to the left, we reach the *Rue de la Faisanderie*, and enter the pretty *Maison de Campagne*, or villa residence, where M. Salomon resides and produces those wonderful portraits which for many months past have excited so much admiration, so much envy, and so much discussion amongst photographers, and have won such high encomiums for the art and the artist amongst people of culture outside of photography.

On entering, we find no pretentious display of specimens in various styles and sizes, but, in a very pleasant little salon distinguished by elegance and taste in every appointment, a dozen or two examples of the one size and style of portraits to which M. Salomon devotes himself. These are not spread about or hung up, but are quietly piled in two or three heaps on a side table. The size of the portraits is 10½ inches by 8½ inches. Each portrait is placed under glass, and bound round the edge with a narrow slip of white paper; but none are upon mounts having any margin whatever. There are no coloured photographs exhibited, and very few persons, we apprehend, would dream of applying colour to the admirable examples of photography before us, which seem, indeed, the very perfection of monochrome portraiture.

Passing out into the garden, and neglecting for the present the sculptural atelier, we find the most recently erected photographic studio, which was used in summer, but is now abandoned for the old studio in which the majority of the pictures at the Exhibition were produced. The summer studio, as we may designate it for distinction, has been not inaptly described as simply a shed, with a glazed lean-to roof, facing south. But it is to be noted that there is not an inch of clear white glass in any portion of the studio. Immediately over the head of the sitter is a row of panes of dark blue glass, and all the rest of the glass is stippled with white paint to produce the effect of ground glass. As, at the time of our first visit, his studio was not erected, and at the time of our last visit abandoned, we cannot give any detailed account of the management of light in it. From the even flood of subdued light which entered the room when we saw it, we should have imagined it difficult to secure vigorous contrasts of light and shade and the fine relief and modelling which characterize M. Salomon's pictures generally; but as one of the finest examples of his portraiture which we have seen—we refer to the portrait of Dr. Diamond, which we exhibited in Conduit Street—was produced in this studio, we conclude that the artist finds means to govern the light to produce the result he requires.

We may remark, before mounting into the other studio, that in the garden is a canopy, underneath which is a background placed; and, we learn on inquiry, that on occasions when extremely short exposure is required, or when, from the lateness of the hour and the badness of the light, operating in the glass-room is impossible, and the production of a portrait is very important, M. Salomon operates in the open air. One of the results which we saw, taken very late in the afternoon of an October day—the sitter being a gentleman who left for India the same evening—was in many respects a very fine portrait.

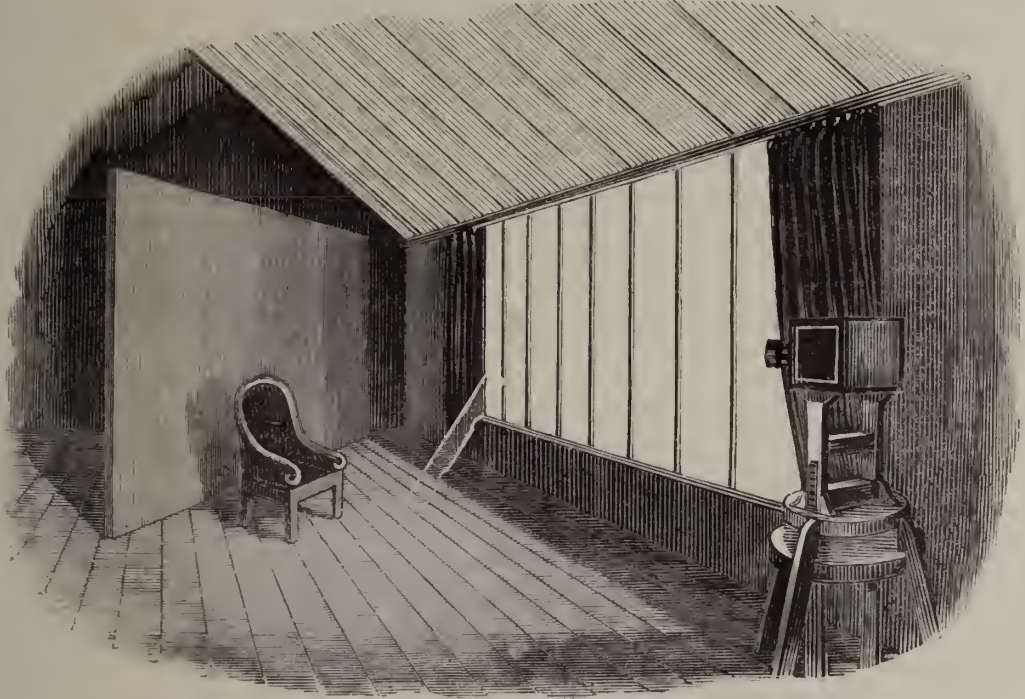
We now mount to the studio in which M. Salomon usually operates. It is a rectangular room about 26 feet long by 16 feet wide, with a ridge roof about 13 feet high at the ridge, and from 7½ to 8 feet high at the eaves. Both

ends and the south sides and roof are opaque, the north side only open to a fine expanse of light. At the north side the roof is of glass throughout, but the whole of the skylight is stippled in imitation of ground glass. This skylight of obscured glass is, from ridge to eaves, nearly 10 feet in depth, and in length about 26 feet; consisting in length of 16 panes of 18 inches wide, and in depth of 4 panes about 30 inches long. At the north side, about 6 feet at each end of which is opaque, the light extends 12 feet laterally, and is a little more than 6 feet deep, reaching from the eaves to within 18 inches of the floor. It consists laterally of 8 panes 18 inches wide, and in depth of 2 panes

36 inches long. Thus it will be seen that the total amount of clear glass in the studio is 72 superficial feet. Curtains sliding on a rod at each end serve to contract, at will, the amount of the side-light, and also to modify its direction more or less in advance of the sitter.

The design subjoined, which we draw from memory, gives a view of the interior of the studio, showing the disposition of the light, and the relations of the camera and background to it. Some points of detail, &c., are omitted, to avoid confusion in the general presentation of the interior.

As we have said, the room is about 16 feet wide; but the operations are chiefly confined to the 10 feet of space



nearest the window, 5 or 6 feet of the width being occupied by a chair, tables, and other accessories of varied and excellent design. The floor is covered with a somewhat dark felt carpet, and the walls with the same material, which give an effect of extreme warmth and cosiness, especially pleasant in winter weather. Although M. Salomon can operate at either end of the room in his usual practice, the camera is placed in the north-east corner, whilst the position of the sitter is somewhat in a diagonal direction, and at a further distance than the camera from the side-light.

We must reserve an account of M. Salomon's mode of working for our next; but before concluding a brief description of the material appliances, we must refer to certain mechanical conveniences in the accessories, upon which, although trifling in themselves, much of artistic success depends.

The use of a column has been in this country so often absurdly misapplied that many of our best artists have discarded it altogether as an unnecessary conventionality. One of the common enormities in using the column has been the Procrustean practice of many photographers. The same column was used alike for short and tall models: a short man leaning against the base of a column, with his elbow raised higher than his shoulder; whilst a tall man leaning his elbow on the same base was compelled to stoop awkwardly, in order to find a resting-place.

M. Salomon uses the column, and often very effectively;

but he provides for the difficulty we have indicated. The plinth of the column is moveable, and can be elevated by means of an Archimedean screw like a camera-stand, so that the cornice of the plinth, upon which the model usually leans, can be placed at any height which convenience or pictorial conditions may require. In like manner the table, which often forms an accessory in sitting portraits, is provided with a similar means of elevation, and is readily accommodated to the height required by the sitter.

For standing portraits of ladies a convenient rest is employed, which we have not seen before. It consists of a piece of wood about a foot wide and three feet long, upon which the lady is invited to stand, and rest the back against a narrow upright piece of wood which is fixed in the centre of the baseboard, and kept firm by a strut extending between the top of the upright and the hinder portion of the baseboard. Great firmness and comfort are obtained by this simple body-rest; and which, supplemented by the head-rest, generally secures steadiness in the model.

M. Salomon appears in all things to require the utmost mobility and ready applicability—we had almost said, plasticity—in his accessories. Everything must accommodate itself to the position of the sitter, instead of the sitter accommodating himself to rigid and immovable appliances. The curtain is not, as is usual, attached to a fixture. On a cross-piece, attached to a rod placed in the base of a head-rest, the curtain slides on rings, and is

readily lifted about to accommodate the position in any part of the room of the sitter, or to occupy any required relation to the background, which is also not only movable, but is constantly moved to produce varied effects of light and shade in the picture. The canopy over the head of the sitter is in like manner readily movable, and when the sitter is once placed in position, he is no further worried with experimental changes to suit the light or existing arrangements. The position of curtains, light, background, tables, chairs, column, or camera—all, or any—are quickly changed if required, to suit the model and produce the pictorial effect which the artist has conceived.

In our next we shall describe M. Salomon's mode of operating: his mode of arranging the light and managing his sitters. In the meantime we conclude our account of appliances by quoting some details from a description* by our friend, Mr. Pollock, an American photographer, who passed some time in M. Salomon's studio during a visit to Europe.

"The lens used was a double combination portrait, by Hermagis, carefully selected, after trial, from six others by the same maker; no diaphragm was used, and in three sittings exposures varied from eighteen to thirty seconds, according to strength of light. The collodion film, previous to development, appeared semi-opaque, creamy, neither very thick nor thin, indicating a full proportion of iodizing, with probably a liberal supply of bromide. The developer acted slowly, considering length of exposure, but brought out a full, dense image, requiring but little intensification, which latter was secured by the addition of a modicum of silver to the developer, and applied, in one case, before washing or fixing; in another, after both operations were concluded. The plates were not fixed in a bath, but held in the hand while a solution of cyanide was poured over them, which acted with energy, cleaning off everything like tendency to deposit on the shadows. The result in each case was a negative yielding prints without retouching, with the characteristic brilliancy of those issuing from this establishment; a marked feature of all M. Salomon's work, visible alike in negatives and prints, being the granulated, flesh-like texture of the skin, closely resembling fine india-ink stippling."

PHOTOGRAPHY AS A PROFESSION.

BY S. THOMPSON.

A MAN'S productions in art, or photography, are the cumulative result of his *whole* culture. Their excellence—if they possess it—is the joint result of natural artistic capability and careful cultivation. It is idle to pretend to *coach* him up in art-knowledge by means of any number of discursive lectures, labelled, "On Taste," "On Feeling," &c., &c. There are no "short cuts" to art-knowledge any more than to other fields of human learning. Once, and for all, that fact may be accepted as an axiom. He must possess the artistic faculty or temperament, emphatically, to begin with, for the want of which nothing can compensate, and then it must be fostered and developed by a lifetime of untiring study; much of it in the *form of careful, thoughtful observation*. The best lessons are often, not those the teacher gives, but those the pupil learns. Such an one is always learning, even unto the end of his career. Every picture he looks at, every shop-window he passes, all he reads, all he sees, that is practical, helps to feed the sacred fire. This long education of the eye—the chief portal through which art-knowledge enters—combined with the artistic nature, at length results in that cultivated art-power we call, in all-confusing terms, *taste, feeling*, and I know not what besides, but which includes them all.

The same in kind, with every artist, though widely differing in degree and in its manifestations, it guides him in the *instinctive* rejection or acceptance of what is good or bad in his work, and is always ready, and always at hand, and is,

in short, *himself*: a finely-polished edge, like a Damascus blade that severs the Gordian knot of difficulty in the endless combinations of circumstance that come before him in his daily practice.

At once above and beyond rules, though not despising them—for rules are for our aid and guidance, not for our abject bondage—he is not fettered by them, but gets above them by outgrowing them, even as musicians often forget their notes by name, and authors the rules of grammar except in practice. Weaker men get entangled and lose themselves in petty theories about parallel lines, and a great deal more; get little rules by heart, that serve them as a straitjacket would. Thus "clinging to some ancient saw," or "mastered by some modern term," the result of culture founded on a basis so narrow is often something that perhaps has no glaring faults, but, somehow or other, is not a picture.

In such a spirit Gainsborough painted his famous "Blue Boy," in half playful, half contemptuous disproof of a dictum of Reynolds, that "the masses of light in a picture should be always of a warm, mellow colour, and that the blue or green colours should be kept almost entirely out of the masses." Gainsborough's instinct kicked at such rules. He felt that every great painter makes his own laws of colour; so here he chose to show that whether blue should tell in the principal light or not, depended on *how* the blue is used; and by mellowing and breaking the tint, as Mr. Leslie has pointed out, has succeeded perfectly. Still, Sir Joshua's is a sound general rule. But rules in *art* are not intended to be straitjackets.

A want of art-knowledge among photographers has now come to be an admitted fact; but it is much to be feared that it is not the means of culture that are so much wanted. They often lie at the very door; and there is a musty adage that says, "The tools will always come to the hand that can handle them." All that books can teach may be found in those pointed out by Mr. Mudd in the YEAR-BOOK. It is very much to be feared that a want of that natural bias towards art in so large a number of those who have taken up the practice of photography is at the bottom of it. Many are now beginning to discern in themselves a want of something, they scarce know what, but by reason of which they have not advanced in excellence beyond the standard they reached some years ago, and eagerly run after anyone who assumes to teach or coach them up, and are swayed backward and forward by any pretender who offers a course of his *clivir vitæ* that is to do the business. This invariably ends, as it must do, in disappointment and desertion to some fresh teacher, again ending in disappointment, blank puzzled faces, spherical aberration of ideas, and universal fog!

Nor can it be alone ascribed to the undoubted fact that the majority were originally designed for altogether different pursuits. It is an equally indisputable fact that many of our most distinguished painters, past and present, including some of the most eminent of the R.A.'s, began life in other trades and professions, some of them in the humblest possible callings. But all of them had an irresistible bias towards art, which made them gravitate to it as naturally as water finds its level. It is also well known that a large number of photographers have entered the lists, attracted by the fact that photography was a very profitable pursuit, and, without deliberating about whether their own abilities lay in that direction, took it up in a purely commercial spirit. On the other hand, whoever heard of a painter who became such influenced only by the same reasons? The hope of making a respectable living, and the chance of something more, may have had its due weight, but the same end might be attained in countless other pursuits. No; they became painters because they could not help it, nor strangle their impulses, even as the poet sings because "he cannot choose but sing." It is no disparagement to a man to say that he may have excellent abilities, and many gifts, but not those which peculiarly fit him for this pursuit. Did he ever ask himself seriously if he had in him the raw material which might be

* In a letter in the *Philadelphia Photographer*.

manufactured into artistic stuff: that question of questions, of more vital importance to himself than anyone else? If he has mistaken his vocation, photography is not responsible. Better for himself and his own future that he should seek "fresh fields and pastures new" now.

Dissentients may perhaps triumphantly instance men of this class who have succeeded. Perfectly true; but the day has now gone by, and we are entering upon another era in photography.

That there will always be a steady demand for an average—if fluctuating—amount of good work is as certain and indisputable as the fact upon which it is based, viz., that photography is altogether unrivalled in some of its aspects and capabilities. But during the carte-de-visite campaign, the art, in military parlance, was put upon a war footing, and a much larger number entered than can be maintained on the establishment in time of peace, much less in time of universal depression.

There is a fatal facility in photography by which one may reach a certain standard. Beyond that it is not so easy. As soon as this standard is carried still further, which it undoubtedly will be, and the goal becomes more difficult of achievement, so will the competitors in the race fall off; and it follows as a natural sequence that the practice of the art becomes more profitable to those who can raise themselves to the lofty argument. While the standard is a low one, the remuneration will be a low one, because the competitors who can reach it will be so numerous. Does this inflict any hardships upon anyone? No; as soon as photography has reached a greater altitude on that mount

"Where Fame's proud temple shines afar,"

men will cease to enter it so readily, but will ask themselves as thoughtfully as if they were proposing to themselves a career which might possibly end in an R.A.'s diploma, whether they have the special talents and bias for success in an art-science like photography.

The ultimatum of what can be attained in art by photographic means is certainly not yet arrived at, nor can be with safety predicted. Some extensive art-fields are at present limited only by the cost of duplicates. In all other modes of multiplying pictorial matter for trade, book, and other purposes, from stone, wood-block, steel-plate, or other mediums, though the artist's work costs incomparably more, the duplicates cost very much less. Thus, when very large numbers are to be produced, publishers and others resort to the above means. Whenever the production of duplicates at all approximating to those from stone or wood in cost is made possible, a price which now seems fabulous can be afforded, and would be willingly given by publishers for original or special negatives by first-rate men.

Far be it from my purpose to discourage the aspirant after art-knowledge, while endeavouring to point out how broad and wide and beautiful a thing it is, and to caution him against the fallacy of "short cuts" and injudicious teaching. That knowledge, though it will never compensate for the want of the artistic nature, will, to some extent, enable him to conceal it. In closing that series of masterly articles in the *Times* on the pictures at the Great Exhibition 1862, their author (Tom Taylor) says that the more he saw and thought about art, the more diffident he became, and that "reference from art to nature is not enough. There is nothing more difficult than to see and know nature. To tell the bulk of people that they may trust to their notions of nature for their judgment of art is simply to mislead them. It requires the labour of a life to apply this standard." Still, he commends the study, and says that while pursuing it, it is hard indeed if we do not gain a stronger sense of that persistent life with which art clothes itself so variously, pursues so many tracks, manifests itself in such various countries, and at times so different from each other, and yet is still art—the adornment of life, the glorifier of use, the dispenser among the labours of men of that beauty which God has everywhere stamped upon the face of His creation.

ENNEL'S HINTS.

This being the time for paying Christmas accounts, I am reminded that I owe you various items, and I now hasten, after a long delay, to discharge my obligations.

In the first place, I owe you thanks for the kindly spirit in which you invariably receive my communications. I am actuated by a desire to disseminate among our brotherhood of the "light-art science," (I object to the hackneyed and current term "black art,") whatever may be, to the best of my knowledge and belief, useful to them. You meet me in a kindred spirit, and I thank you for it.

Secondly, I owe you an answer to your comments upon my last (p. 570); and thirdly, I owe you a grudge for having misinterpreted the meaning of some points in the same.

How such a debt as the third can be satisfactorily settled may be a question for *Punch*, or metaphysicians, to decide; but you will, perhaps, help me out of my difficulty by owing me a grudge for entering into a sort of controversy with you. We shall be quits then.

To return to your commentary. How, and where, have I mistaken the *purpose* for which certain modes of obscuring the glass is recommended"? Believe me, I know the purpose, and I have never, directly or indirectly, denied it. But you will admit that light is not every day alike, nor at every part of the day. On this axiom my proposition is founded:—"Put not a permanent obscurer against an occasional intruder."* You yourself suggest blinds of tracing cloth, or double sashes, evidently preferring movable to permanent obscurers, and I am glad we agree. I am also of your opinion that Venetian blinds and calico are too dense in many cases. I never recommended them, as would appear from your remarks, but "light, white blinds, on the Venetian-blind principle," i.e., wide flys of (say) tracing cloth on light frames instead of narrow wooden bars. Our climate is such that frequently we cannot afford to lose even that little light which starch obstructs. A movable thin screen is therefore the best of the two. I enclose a sample of starched "book muslin." Photometrically it is far less dense than the accompanying tracing cloth. Manufacturers of the latter would do well to treat muslin stuffs in the way of their tracing cloth for photographic purposes.

To tell truth, the greatest majority of photographers, though they talk a great deal about light and lighting, yet grope in the dark in this respect. They are mostly "shade blind," to use a term analogous to *colour blind*. They cannot appreciate a delicate *shade*, technically *half tones*, in a sitter's face, but a downright dark shadow. The clumsy means to which they have recourse in trying to attain at a desired effect are truly ridiculous. Not to speak of the mechanical means, they seek it in collodion, developer, and intensifier, according to this or that advertisement, and, these helps failing, as of course they must, if the lighting is wrong, they at last believe it. And now how to set about it is the question. Well, A. Salomon produces good effects; *ergo*, they say, we must adopt his mode of lighting. He has a frosted skylight; therefore, we must have it too. Verily, I say, his skylight requires something additional—chiefly judgment. And we must not forget that our climate is not that of Paris. Slavishly following a given example through thick and thin is neither art nor science. What is wanted is a practised eye, and judgment to select appropriate appliances to suit particular circumstances.

Have I allowed myself to be carried away? Well, snip away with your editorial scissors as much as you please.

* Our correspondent still regards the use of starch as intended to keep out an occasional intruder, and implies that because the intensity of light is constantly varying, a constant veil of any obscuring material is an error. But the relation between clear glass and obscured glass does not vary, and some photographers prefer as much pure light as they can get through clear glass for direct and principal lights, and a relatively equal proportion of softened or subdued light for illuminating the shadowed parts slightly, and so producing harmony, and avoiding black opaque shadows. No matter what the condition of the light, the relation between that through clear glass and that through obscured glass will be much the same. For shutting out occasional direct sunlight, moveable blinds are doubtless best. The book muslin enclosed would probably be very useful.—Ed.

Allow me to make another observation. In your article aforesaid, you speak of the slope of the roof as if I had mooted that question. I only spoke of this or that inclination—i. e., flat roof, ridge-roof, &c.—as the context will show. The same as regards the height of the roof. It was the height of roof, *per se*, particularly in relation to Mr. Blanchard's observation at page 525, to which I referred. Mr. Blanchard wields the pen of a ready writer: let him, *pro bono publico*, explain his meaning.

I will turn to another subject. On reading J. Q. A. Tresize's article on Stereographs, quoted by you, p. 588, December 6th, 1867, from the *Philadelphia Photographer*, a thought momentarily struck me that, after all, the numerous "hints" which are scattered broadcast in your valuable *Journal*, are, in a majority of cases, only thrown away. In that article the old mode of transposing stereoscopic prints is still prescribed; whereas my *modus operandi*, as exhibited last year at a meeting of the South London, was quoted fully in the very same *Philadelphia Journal*. But, on the other hand, I know that some photographers have adopted my plan here, on the Continent, and in America, so I may rest and be thankful.

In endorsing almost every word of my esteemed friend, Mr. J. Hughes, read by him at the late meeting of the London Photographic Society, I would nevertheless pick a hole, a very small one, in one remark of his. "When a man calculates closely . . . how many cartes he can get out of a sheet . . . such a man is sure not to succeed, for he ignores all the other elements," &c., &c. In the face of this remark I am not ashamed to own that I do always get forty cartes out of a sheet instead of thirty-two (gaining 25 per cent.—how tradesmanlike!), and every one whom I have shown the method thanked me for it. I cannot see, for the life of me, how thereby "all the other elements are ignored." I have heard many a one state as an axiom, that there must be no economy in photography. Why? If they mean it in the sense of stinginess, I agree with them. But then it applies equally to all transactions of a rational being.

Perhaps some of your readers may wish to know how I cut out ten cartes from a quarter sheet. Well, here is the plan:—By a flat, parallel gauge, $2\frac{1}{2}$ inches wide, cut off longitudinally two strips; each yields three cartes. The remainder may be used for two cabinets or four cartes. Faulty bits I use up for chess problem papers.

Being on the subject of the depressed state of photography, I agree with your view of the case, viz., that the late money crisis has a great deal to do with it. Nearly every trade or profession tells the same tale, and the Government returns of this month would seem to point in the same direction.

ERRATA.—Page 574, second column, line 2, for "continued" read "continuous"; line 23 from top, read "Venetian-blind principle"; line 19 from bottom, read "45°" for "50°."

Correspondence.

HYPOSULPHITE OF AMMONIA FOR FIXING.

DEAR SIR,—I am indebted to you for calling my attention to the short editorial article that appeared in the *PHOTOGRAPHIC NEWS* of 10th May last, in which you reported the use of hyposulphite of ammonia as a fixing salt by Mr. T. H. Redin, Governor of Carlisle Gaol; and at the same time mentioned the circumstance that, if further trial should establish its superiority over the soda-salt, a method of preparation devised by Mr. Losh was available by means of which it could be cheaply manufactured.

Since reading my paper "On the Hyposulphites" at the Photographic Society I have gained more experience respecting the preparation and properties of the ammonia-salt, and find that it is very soluble in water, somewhat difficult to crystallize, and that the crystals are deliquescent.

I have not yet definitely determined what form the hyposulphite of ammonia takes; whether, according to Sir John Herschel, it crystallizes in small needles, or, as Rammelsberg states, in rhombic laminae?*

Here is an interesting allusion to the hyposulphite of ammonia, and to its property of dissolving the chloride of silver. I quote from an early chemical treatise, by Colin Mackenzie, entitled "One Thousand Experiments in Chemistry," fifth edition, dated 1825.

"EXP. CCCVIII.

"ACTION OF HYPOSULPHITE OF AMMONIA ON MURIATE OF SILVER."

"When hyposulphite of ammonia is poured on muriate of silver, it dissolves it; and if into the saturated solution alcohol be poured, a white salt is precipitated, which must be strongly expressed between blotting-paper, and dried in vacuo. It is very readily soluble in water, and is extremely sweet to the taste. Its sweetness is unmixed with any other flavour, and so intense as to cause pain in the throat. One grain of this salt communicates a perceptible sweetness to 32,000 grains (i. e., nearly half-a-gallon) of water. If the alcoholic liquid be evaporated, thin, lengthened hexangular plates are sometimes formed, which are not altered by keeping."

The writer was evidently acquainted with the pure hyposulphite of silver, and its proneness to decomposition, for he appends to the above the following observation:—

"When the hyposulphite of ammonia refuses to dissolve more muriate of silver, if an additional quantity be added, it is rapidly converted into a white crystallized powder. It is extremely insoluble in water, but readily and abundantly in ammonia, forming an intensely sweet solution, from which an acid precipitates it unaltered, even when copiously diluted. Dried in vacuo, and kept in a closely stopped vessel, it blackens and undergoes spontaneous decomposition. The phial, whenever opened, is found full of sulphurous acid; and when (the decomposed substance is) washed with ammonia, a considerable residue of sulphuret of silver is left. Heat effects the same change at once."

Modern chemistry seems to have added but little to the information here given, beyond supplying the analytical proofs of the several decompositions here mentioned.—I remain, dear sir, yours truly,

JOHN SPILLER.

Woolwich, January 18th, 1868.

INDIA-RUBBER FOR MOUNTING.—DISTILLED WATER.

DEAR SIR,—In discussing the durability of india-rubber cement for mounting, it seems not to have been remarked that the pure rubber is much less liable to oxidize into a resinous powder than gutta-percha, or even than many of the varieties of mineralized rubber. You must have noticed that both gutta-percha and some sorts of elastic rings, after being put away for some time, are found quite brittle, and sometimes of the consistency and elasticity of cheese-rind; but do you recollect anything of the kind happening to the pieces of bottle-rubber, or even to the manufactured squares used for erasing pencil-marks. Such pieces are occasionally found in desks or drawers where they have been lying for years, and in their original good condition. I have an old pattern-book, manufactured in 1855, with a rather thick solution of rubber round the edges only of the prints. They are now quite firm, and not easily removed without tearing. No doubt the prints which have been referred to as separating from the mounts—sometimes in a day or two—had too thin a coating. I have lately tried the solution sold for Swan's carbon process. It answers very well if three or four coats are given to the print, and one or two to the mount; but even then seems much thinner than what I used before. The dark colour of the cement shows a little in the pattern-book, and would be an objection to so thick a solution.

* Gmelin's "Handbook of Chemistry," Vol. II., p. 454.

With regard to the protection afforded by india-rubber against injurious substances in the mounting-board or paper, it seems to be forgotten that, except in the case of single and framed prints, the face of one will usually be in close contact with the back of the neighbouring mount.

Whilst I am writing, let me confirm Mr. Cherrill's statement that for ordinary photographic operations distilled water is quite unnecessary. I have not used such a thing for upwards of ten years. For the negative bath the water requires purification with oxide of silver; but for all other purposes Thames or New River water will do, just as it comes from the tap.—Yours truly,
RUSSELL SEDGFIELD.

[There is, doubtless, as we have before observed, great difference in samples of india-rubber; but we think we have seen the gradual deterioration by air and light of very good and pure samples; and the thinner the layer, of course, the more readily it becomes completely oxidized.—Ed.]

THE DISCOVERY.

SIR,—Having heard that, by dint of study and perseverance, Mr. McLachlan had come across a valuable method of working, I read his letter in your last with delight. When, however, I studied over that portion which describes the large quantity of perfect negatives from so small an amount of silver, although not desiring to be sceptical, I felt that an immense boon would be given to the "cheap Jacks" were this found to be so.

I am at once an enemy to the race there has lately been for cheapness; I know, also, Mr. McLachlan is an enemy to the five shilling per dozen cut. I therefore think those who have kept up their prices are worthiest to be benefitted by Mr. McLachlan's generous offer; and it occurs to me that if Mr. McL. can devise some way of letting only the worthy into the secret, he will get as much credit for his skill and generosity, besides punishing the low lot, and will also do an act that will tend to raise the quality of photography in respectable places where, at times, difficulties occur.

I fancy I hear some of the "Jacks" cry out, "Selfish mortal!" My only answer is, that they have done all in their power to disgrace photography, and have erected barriers to the progress of cultivated taste in this department of the pictorial world which will take years to break down.—I am, yours,
LITO.

CARBONATE OF AMMONIA IN THE FIXING BATH.

SIR,—Allow me, who, by bitter experience, has acquired some right to speak, to protest against the use of carbonate of ammonia in the fixing bath.

Along with many others, I believe, I adopted it because recommended by many who I thought ought to know. But a variety of failures have driven me to give it up again. Yellow spots would form in the pictures for which I could find no cause, and those which had no spots turned yellow after a comparatively short time, especially if exposed to damp, or closely confined, which, perhaps, may explain some of the failures of varnished prints.

Increased precautions were tried with only a slight benefit. So, bothered and disappointed, I gave it up, and got pictures as good as those I used to have.

When using the ammonia, the bath (especially if used twice) had an unpleasant sulphur smell; but I think it was not the same as the addition of an acid causes.

I trust some of your correspondents will be able to throw some light on the subject.—Yours obliged,
HYPO.

[We shall be very glad to receive accounts of the experience of our readers on this subject; but we must caution our present correspondent and others against the *post hoc propter hoc* form of argument. That it has happened that whilst using carbonate of ammonia he has also, from some cause which, without knowing more about the operations, we cannot explain, met with yellow spots, &c., we do not doubt;

but he might almost as well attribute extreme redness in his prints to the use of gold in his toning bath, as sulphuration and yellowness to the use of an alkaline fixing bath. The cause and the result he describes have no affinity.—Ed.]

Talk in the Studio.

PRESERVATIVE NITRATE OF SILVER.—A new form of nitrate of silver, under the name of "Sel Clement, or Preservative Nitrate of Silver," has recently been introduced to our notice by Mr. C. E. Elliott, who states that it is a French production. It is especially intended for printing purposes, for which the prospectus states that it is equal, and in some things superior, to ordinary nitrate of silver, whilst it is much less in price, being only 2s. 9d. per ounce. The very unsatisfactory weather which has recently prevailed has prevented our undertaking comparative trials with it. A hasty examination shows that it has, as might be expected, a large portion of foreign matter, not nitrate of silver, mixed with it; but practice alone will determine whether, all things fairly considered, it is an economical article to use.

TO STIPPLE THE GLASS AND SUBDUCE THE LIGHT.—We are favoured with the following by a correspondent, who describes it as an excellent method—"Take patent dryers and add one part of boiled oil, two parts of turps, and a very small quantity of ordinary house decorator's varnish, which will give it a tacky nature, and will cause it to work much better: it must be much thinner than ordinary paint. The dryers are of a transparent nature, and if you want a greater body, add a little white lead. The white lead should not be used alone. Now for the way to work it: lay it on as even as you can with a painter's brush or tool; then let it remain a short time to let part of the spirits evaporate, and stipple it with a new pound-brush or dust-brush, and then, if you want a better finish, take a piece of cotton wool and cover it with a fine piece of muslin, and carefully press it all over."

To Correspondents.

* * * Correspondents will save some trouble and confusion by adopting signatures more specific and distinctive than "A Subscriber," "A Constant Subscriber," "A Constant Reader," &c.

CONSTANT SUBSCRIBER.—In producing stereoscopic transparencies in a copying-box you must use a pair of lenses, one for each half of the stereoscopic negative. Your attempt to copy both halves of the negative by means of one lens must necessarily be a failure in two ways: first, you will have difficulty, unless you use a very small stop indeed, in producing equal sharpness throughout; and, second, if you succeeded, the halves of the slide would require transposing after the transparency was produced. By using a pair of lenses both these difficulties will be removed: you will have no trouble in getting each picture of the pair properly defined; and each being reversed by the operation of copying, no transposition will subsequently be required. So far as the question of sharpness is concerned, by using the lens you mention you may get a sharp copy of a large size by employing a small stop, a condition generally necessary in copying.

A SUBSCRIBER.—We believe that a letter addressed to the gentleman in question, at Birmingham, will reach him, without more detailed address.

W. S. (Cromer).—We do not remember the price of a good book on coins, but will make some enquiry, and, if we ascertain, will let you know. You will obtain information by writing to J. R. Smith, Bookseller, Soho Square, who publishes works of that class.

WASP.—The *Philadelphia Photographer* can be obtained of Trubner, Paternoster Row.

J. W. H. A.—See answer above. You can order it and receive it monthly. 2. Tracing cloth or tracing linen is the best material we know. See "Ennel's Hints" in our present number.

3. Much depends on circumstances, and whether you can afford to stop out a considerable amount of light permanently; if not, blinds will answer best. 4. Stippled glass obstructs a large amount of light, but, with the studio you describe, the amount of side light would probably be sufficient at all times for your principal light, and the light from an obscured skylight probably be sufficient to illuminate the shadows and give harmony.

IGNORANCE.—Bee's-wax is not perfectly soluble in ether; but, by cutting into shreds and macerating, you will get a saturated solution. Benzole, or an essential oil, like that of lavender or rosemary, is a better solvent.

TITUS WAY.—There are various works on "Mesmerism," but in most of them there is a considerable mixture of imperfectly understood science, delusion, and humbug. That an occult natural power, designated "Animal Magnetism," exists, there can be little doubt; but the knowledge of it has not been reduced to a definite physical science, and what is known is largely mixed with quackery and charlatanism. Dr. Teste's "Manual of Animal Magnetism," published by Balliere, Regent Street, is a tolerably complete book on the subject. The "Zoist," which used to be issued periodically by the same publisher, is devoted to the subject.

2. There are a variety of modes of making ice in summer. You will find several recipes on page 395 of our last volume.

D.—We are not familiar with the art educational facilities to be obtained in Scotland, but it is tolerably certain that in Edinburgh and other large Scottish cities such facilities exist. In Edinburgh there is a Scottish Royal Academy. Should we be able to gain the information for you, we will give it on a future occasion.

R. M.—The silvery foggy deposit in your shadows is most probably due to the use of damp glass, and is most common in cold damp weather, when the coldness of the glass rapidly causes a deposit of the moisture on the atmosphere on the glass, even during the operation of coating the plate. It is generally under the film, and shows most at the back of the negative. Very slightly warm your glasses before coating the plate. Sometimes the use of impure acetic acid will cause a similar defect.

F. M. YOUNG.—The lenses you mention are the best for stereoscopic landscape work of any we know. You will not get any equal to them, we believe, at a less cost. 2. Mr. Mawdsley's method of alkaline development, described in the YEAR-BOOK, is applicable to any process in which alkaline development is suitable. 3. The especial claim of the gum process, as described by Mr. Gordon in the YEAR-BOOK, is the superior keeping qualities of the plates. We cannot, from personal experience, give you an estimate of the relative advantages of this process and the coffee process. We have had several private communications recently, speaking in very high terms of the latter, and thoroughly endorsing Mr. Joceelyn's statements. We hope for some further communication on the subject from that gentleman and from one or two others who have promised to state their experience in the matter.

A SUBSCRIBER.—Messrs. Marion & Co. publish a large number of photographs of the architecture of Spain. Mr. Thurston Thompson has recently taken a large number, also, for the Science and Art Department at South Kensington; whether they are yet published or not we are uncertain.

II. W. (Croydon).—Much depends on the thickness of the collodion you obtained. Many samples will work well without any further addition of alcohol. If, on trying, you find it too thick, then you may add (say) half the amount of iodizing solution indicated by the makers. If the collodion be not too thick, you will require a larger proportion of iodide, and also, for some purposes, of bromide, than you have added. For ordinary purposes, 4 grains of iodide of cadmium and 1 grain of bromide of cadmium (per ounce) will serve; for subjects having much contrast half a grain or a grain more bromide may be used. 2. Collodion bottles are better kept upright, so as to secure perfect subsidence of any residue. Those not in use should be carefully corked or stoppered and tied down. 3. We believe that both samples you name will answer for transparencies.

W. J. A. G.—We advised the use in a tunnel glass-room, with a sloping front light, of blinds sliding from side to side, for the following reason:—We should generally use the blind placed so as to cover something more than half the skylight, the sitter being under that portion; the portion uncovered to join the side-light uncovered forming a continuous high side-light. The plan you suggest also is good: by having two blinds on rollers, running from top to bottom, one might be kept down altogether to secure shadow, and the other as much withdrawn as you choose. This plan, in conjunction with the lateral sliding plan, would give great control over the light. The tunnel is not an evil *per se*; but the sloping front light, which used to be recommended in conjunction with it, is so, unless the studio be of large proportions; but the ridge-roof undoubtedly is simplest and most manageable. 2. We recommended fastening the cord to each ring to secure even running, but if you find fastening to the last ring answers, of course all is right. 3. We have not heard of pin-holes in the coffee process, but they are a frequent trouble in the tannin process, to which, in some respects, the coffee process is analogous. The use of a very dilute preliminary coating of albumen has been recommended as a preventive; but we are not partial to introducing plates so prepared into the nitrate bath. 4. In the coffee process, the addition of a very minute trace of citro-silver with the first application of the pyro developer is generally desirable, unless you use the alkaline developer. A fuller exposure would enable you to get out the image faintly with plain pyro. The question of sufficient exposure is altogether a relative one. As a rule, with alkaline development much shorter exposure is permissible. 5. With a large aperture, we have no doubt that the lens in question will give you instantaneous pictures in suitable light and of suitable subject; but it is not the most rapid stereo lens. 6. Small pictures will bear a much higher glaze than large ones: we agree

with you in thinking an excessively high glaze for large pictures vulgar and inartistic. Hypo is the cause of the stains.

OXONIENSIS.—Something depends on the dimensions of such a room as to how far good results can be produced. If it be sufficiently large to permit suitable arrangement of blinds, good results may be obtained. Cover the skylight from top to bottom, for about two-thirds of the width, with white blinds on the south half, using the light from the north-west, inclining the sitter a little to the east, and working diagonally with the camera in the north-west corner. 2. Almost any dark carpet will answer if the tints are tolerably uniform without great acinic contrasts: browns are good colours. 3. Either of the tents you name are good, and they are very similar in character. We can scarcely say which is best. Thanks for your complimentary remarks on the YEAR-BOOK.

W. B. A.—There are several modes of enlargement, but the details of any of them are much too lengthy for insertion in our column of answers. You will find an account of a method of enlarging with the magnesium light in the present number; you will find in the latter end of our last volume, and also in our YEAR-BOOK, a description of a very simple method of enlargement. If you have the volumes of the NEWS you will find articles on producing enlarged negatives, and, also, on using the solar camera. If you have to begin your experience in enlarging and wish to utilize your present apparatus, you cannot do better than adopt the plan given in our YEAR-BOOK. With your quarter-plate lens and camera, and your whole-plate camera, you may easily improvise arrangements for enlarging cards to whole plates by the process described.

A CONSTANT SUBSCRIBER (W. H.).—The streaks may be due to various causes, but one of the most common is immersion of the plate whilst ether is still evaporating from the film, and the repulsion between this and the bath during the process of immersion causes streaks. The most certain remedy is moving the plate rapidly about both vertically immediately after immersion instead of allowing it to remain still a short time; also let the film set well. The lighting of the figure is pretty good.

Q. Y.—As you do not state which of the methods you have used for toning, or which of the methods of transferring we described, we cannot well suggest the cause of your failure. It would seem, from the failure you send us, that you have attempted to remove the film when dry. In using the dry method you will bear in mind that the paper and film both should be damped again before removing; also, that if the glass be treated in the first instance with wax, the transfer is more safely effected. In the question of toning there appear to be two or three errors. In the first place the image has been scarcely sufficiently clean and vigorous to commence with. There is a little deposit on the pure whites which should be avoided. A gelatino-iron developer would help you in this respect. Next, whichever system of toning you have adopted, you do not appear to have allowed it to permeate the film thoroughly, so as to be as perfectly at the side next the glass as on the upper surface. Should you fail after further trial write again, stating details of the process you pursue, and we then may be able to help you.

B. MAGIC.—A quarter-plate lens may be used for a magic lantern with advantage. You will find details and diagram in our eighth volume; also instructions in our last volume. 2. There are several processes for photographing on wood, all of which have been described in our pages. For what purpose do you require the operation? If for wood-engraving, you must use box-wood. The process with uranium and silver in collodion, described in our eighth volume, will answer well. You can use oxalate of silver for the process, or oleate of silver. If for ornamental purposes, a smooth white wood, like sycamore, answers well, and the collodio-chloride process is simplest.

J. BULLOCK.—We do not remember the communication to which you refer. We should think, however, that you would be able to get microscopic glass of Mr. How, Foster Lane.

F. S. B. L.—Although, as a general principle, we disapprove of front light, yet, in your case, we think that the portion of front light in No. 1 will at times be useful. As a rule, it should be covered with blinds; but in dull weather, and for some sitters, you will find it an advantage to be able to use it. Therefore, on the whole, we prefer No. 1, which will, we think, answer well.

W. G. G.—Crush a little of the slag, and digest with water or with hypo. The addition of sulphide of potassium will enable you to ascertain if any silver salt is present. Plumbago crucibles are not the best. Those known as London pots, of burnt clay, are the safest.

II. S.—Received, and shall have our attention.

ENGINEER.—The fault of which you speak is new to us. We will give attention to the matter, and answer in our next.

II. B. (Bradford).—Your question is scarcely sufficiently clear. You ask if the "color-taste" of alkaloids is infallible. Do you mean colour test? and infallible in relation to what?

RECEIVED: "Photographie Mosses for 1868." "The Art of Photographic Colouring," by David Rees." An important communication on Blisters in Albuminized Paper, some Reviews, and other articles are compelled to stand over for lack of space. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
The Electric Light for Photography.....	49	Lectures on Art	56
Visits to Noteworthy Studios.....	49	Correspondence—Hyposulphite of Ammonia—Mr. McLachlan's	
Serious Fire at Mr. Claudet's Studio in Regent Street	51	Discovery—"Cheap Jacks" in Photography—Carbonate of	
Foreign Miscellanea.....	52	Ammonia in the Fixing Bath—Persistence of Photographic	
Pictorial Effect in Photography.....	52	Images on Glass.....	57
Blethering of Albuminized Paper.....	53	Talk in the Studio	59
The Production of Photographic Enlargements. By D.		To Correspondents.....	60
Winstanley, Jun.	54		

THE ELECTRIC LIGHT FOR PHOTOGRAPHY.

Mr. WOODBURY has recently superintended the arrangements of Disderi and Co. for producing gelatine reliefs for the photo-relievo printing process by the use of the electric light. The light is obtained by means of the Alliance Company's (French) electro-magnetic machine, which Mr. Woodbury considers has some important points of superiority over Wilde's electro-magnetic machine, inasmuch as a similar amount of light is obtained by a very much less amount of cost in wear and tear; the result being obtained in the French machine by 400 revolutions round several electro magnets, which in Wilde's is obtained by 3,000 revolutions round one electro-magnet. It will readily be seen, therefore, that the wear and tear is much less in the French machine than in one in which the exceedingly rapid rate of revolution involves much friction and frequent breakage. The cost of each machine (about £250) is about the same. The power is obtained at Disderi and Co.'s establishment by means of one of Lenoir's gas engines. The cost of gas is, of course, great; but there is the especial advantage that the power can be secured and dismissed without waiting or delay, so that no waste of fuel is involved. Mr. Woodbury estimates that the amount of gas burnt in obtaining the power would give a light nearly equal in amount to that obtained from the electro-magnetic machine; but, of course, the latter would be in a form less available for photographic purposes. The battery power necessary to secure a similar electric light would require about forty of Bunsen's cells. The cost in his present mode of working is one shilling per hour for gas, and about two-pence for carbon points. The time of exposure necessary for securing a gelatine relief suitable for his purpose is about four hours, the negative being placed eighteen inches from the light, several printing-frames being, of course, arranged around one light.

One singular point is worth noting in the matter. As light loses in intensity in the ratio of the square of its distance from its source, and the rays which reach the margin of the 10 by 8 plate are necessarily further from the point of light emitted by the carbon points than the centre of the plate, it follows that the margins receive less illumination than the centre. This, at first sight, would appear to present a difficulty. But in the case of most negatives there is fortunately a compensating quality. In the majority of instances there is a slight falling off in the illumination of the negative towards the margins, which are, therefore, slightly less dense than the centre; so that a light of less intensity passing through the margins does as much work as the intenser light passing through the central portions.

Another peculiarity of the electric light is worth noting. It possesses much greater penetrating power than sunlight, so that a negative which with sunlight would give a flat

image, with very little relief, yields with the electric light deeply recessed hollows, and great relief. In other words, a much denser negative is required for sunlight-printing than is required with electric-light printing. The relation of the lights in intensity, as measured by the exposure—the negative being 18 inches from the electric light—is as 1 to 24; that is, sunlight would effect in ten minutes what the electric light requires four hours to produce.

VISITS TO NOTEWORTHY STUDIOS.

M. ADAM-SALOMON'S STUDIO—SECOND VISIT.

LET us now renew our visit to the studio of M. Salomon. It is ten o'clock on a fine October morning, and the artist comes from his sculptural *atelier* covered with the clay and plaster with which he has been hard at work, we learn, since sunrise, between six and seven o'clock, for his devotion to two professions demands the due apportionment and economizing of time. We ascend to the studio we have described, and he proceeds to pose a lady. Finding that she wears some elastic jupon or erinoline which distends her dress instead of allowing it to fall in simple folds easy of control and arrangement, he decides upon a standing position, the erinoline skirt being quite unmanageable for graceful folds in a sitting figure. The dress is of a somewhat light silk, scarcely effective for pictorial purposes, and he determines that a black lace shawl shall supplement it. The lady is first of all requested to stand perfectly easily upon, and supported by, the body-rest we described in our last, and, when an easy position has been secured, presenting little more than the profile of the figure to the camera, the face inclining from the light, the lace shawl is arranged in graceful festoon-like folds, so as to fall over the principal part of the skirt of the dress. It is attached by a pin to the wooden body-rest behind, and held in front carelessly by one of the hands, which droop easily, loosely crossed over each other. The general arrangement being secured, M. Salomon steps back a few paces and contemplates the effect, never looking in the camera. A dark mass is now required, and a velvet-covered chair is placed behind the lady, and a crimson curtain of silk brocade or tabaret is arranged in fold, partially resting on the chair, the general line of the curtain repeating, but varying, the chief lines in the figure. This same curtain, on being placed in shadow, is dark, but here it was placed in the light, so that it repeated, in a slightly lower degree, the light tone of the dress, whilst it cast a shadow on the background, throwing it back and giving relief and solidity to the figure and accessories in front of it. After a glance at the general effect, the blinds are modified a little, so as, in this instance, to concentrate the light less; and the portion of the background in front of the figure is then brought round tolerably close to the figure,

and nearly facing the strong side-light. Last of all, the head-rest was placed in position, the face turning a little more than the body towards the camera and the light. Until this moment the image in the camera has never been examined, but a glance towards the lens has been given now and then whilst arranging, to observe the relation between it and the model. The position and accessories having been satisfactorily arranged, the image on the ground glass is examined and focussed, and, without the delay of more than two or three moments, the exposure commences. It is only fifteen seconds, and after a brief rest and a slight modification in the position of the head, a second plate is exposed for about the same time, two dark slides with prepared plates having been just before handed from the dark room through a small aperture or door behind the background, through which, after exposure, they pass back again into the hands of an assistant for development.

Whilst the plate is developing, we will glance for a moment at some further arrangements of the studio, which are not shown in the sketch in our last. The camera and lens are protected from the light by a light frame-work, which projects about twenty inches in front and behind, and over which a black cloth is hung. This, in front, protects the lens from diffused light, and behind enables the operator to stand conveniently under it whilst examining the image on the ground glass.

One of the subjects of much discussion has been the light and shade upon the background, which many have supposed to be chiefly due to masking or sunning down in the printing. That such aids to effect may occasionally be used is quite possible; but, as a rule, this is clearly not necessary, as the effects are easily obtained in the studio. We have before described, as one means to the end, a canopy attached to the background tolerably close to the head of the sitter, casting a shadow on the upper portion of the plate. But a more important means of securing light and shade on the background consists in the position it often occupies in relation to the side-light. Unlike the common practice of photographers, M. Salomon does not take pains to place the background quite parallel with the camera. In many instances, whilst one end is placed in the shadow quite behind the side-light and at a good distance behind the sitter, the other end is brought round so to receive a full amount of direct light from the side window, and is also brought tolerably close to the sitter. This arrangement effects two or three objects: one end of the background becomes in the picture very dark, whilst the other is moderately light, and so aids the effect of light and shade in the picture. Further, the background being placed in this position, some idea of which will be formed from its position in our diagram in the last number, it serves in some degree to reflect a little light on the retiring and shaded half of the sitter. The direct light from the side, which illuminates one side of the sitter, also reaches the background, against which the shadowed side of the sitter is relieved; whilst the part of the background against which the lighted side of the sitter appears, being placed back, escapes this light. It will thus be seen that, in the picture, the lighted side of the face appears against the shadowed side of the background, and the shadowed side of the head against the lighted side of the background, a mode of arrangement which conduces very much to the sense of relief and solidity in the head, and gives the retiring character to the background, producing an effect of space and atmosphere. This mode of treatment may frequently be observed in the portraits by Sir Joshua Reynolds.

The negatives are now developed, and brought by M. Salomon into the studio. They are both technically excellent, clean, and brilliant, with a few points of very dense high light, much gradation, occasional touches—though in this case very few—of bare glass in the deepest shadows. They have been developed with iron and intensified with the same solution to which a few drops of nitrate solution have been added. For fixing, a strong solution of cyanide

is used, and occasionally, if desirable, a little local intensifying is produced by the application of iron and silver to certain parts of the plate after fixing. The chief point which engrosses M. Salomon's attention in examining the negatives is the modelling in the face, which, to satisfy him, must accurately repeat the light and shade he had seen on the face in lighting and arranging it; his education as a sculptor rendering him peculiarly quick to feel and exacting in securing this modelling.

Another lady follows: and here, to the artist's delight, there is no crinoline, and a sitting position is selected. A blonde English girl of eighteen is the sitter. She is placed in a chair, profile to the camera, the elbow resting on the table, the head on the hand, and a book before her, a little pains being given to break the continuity of light on its edges by giving dog's ears to the corners of the leaves. She wears a black silk dress with broad black velvet trimming edged with white lace, the spotty effect of which gave us apprehension for the result, but in M. Salomon seemed to cause but little concern, the reason for which we saw hereafter. The soft and yielding folds of the dress, undistended by any obstinately elastic and balloon-like jupon underneath, were carefully manipulated into the folds which the sculptor knew so well how to arrange. The aim appeared throughout to bring the ridge of a fold prominently into the light, and to make the furrow behind it deep, and shaded by the fold from the light. All the principal folds were arranged so that the light reached them, and cast their shadows definitely in one direction. In this instance there was more material to work with, and the artist became more deeply interested in its arrangement. After placing the sitter in the chair, the general outline of the composition was arranged, the curtain being placed so as to fall in folds in some degree repeating those of the dress, and the folds of the table-cloth in front were also arranged so as to form similar lines with slight variation. The table was a small square one, and we noticed that the corner was generally placed opposite the camera, and the cover arranged in a massive fold at that corner. It will be seen by those familiar with artistic composition that the angular form here prevailed, all the lines running diagonally across the plate from top to bottom, the balancing line consisting of the white edge of the book, which was leaning against a pile of other books on the table. At the commencement of the sitting he asked the friends who were present to continue to converse with the sitter upon any topic but the coming portrait, which the sitter was requested to forget, leaving entirely all responsibility in M. Salomon's hands. He also seemed to forget the presence of any animate being, becoming absorbed in the treatment of his subject, which seemed in his hands like the modelling clay, and almost as submissive and plastic. A fold here is arranged, and a lock of hair there; the hands are gently manipulated, the position of each finger being gently but certainly modified. A quiet, low-toned commentary is kept up by the artist, half-suggestive instruction or encouragement to the sitter, and half soliloquy, "*La, la! Bien! Restez-vous tranquille,*" &c., delivered in a quiet, reassuring tone. In every instance of several sitters we saw, the trust in the artist's skill ensured by his reputation, and the magnetic influence of his manner, which expressed perfect confidence in his own operations, had a most beneficial influence on the sitter, tending at once to ease and steadiness.

Of this young lady four portraits were taken, with slightly different views of the face, each plate receiving fifteen seconds' exposure; each negative being good, and evidently very fully exposed. The lens was used with full aperture; it was, indeed, one of the old character, not supplied with any stops at all. These negatives exhibited numbers of small spaces of bare glass in the deepest shadows, the white cuffs being the only dense points in which the deposit was absolutely opaque; the densest lights in the face readily showing the interposition of any object placed at the back of the plate when it was held up to the light. The negatives were

of a rich, good colour, very full of gradation, and possessing plenty of deposit in all the lights and half lights. Although they possessed something of the positive character when examined by reflected light, they were not meagre or thin negatives, but were full-bodied and rich; alike without hardness or the unnecessary deposit which increases the time of printing without adding to the vigour of the print.

Some gentlemen followed, and the operations proceeded in a similar manner. M. Salomon, in many instances, seated himself to indicate the position to be assumed. In rarely any instance was the sitter moved after being once placed, especial care being taken to avoid worrying or disturbing the equanimity of the sitter. The accessories, the camera, and the arrangement of light are all modified to suit the position once assumed. If, when the sitter has rested his arm upon the table, it is found to be too high or too low for comfort, the height is adjusted at once by means of the Archimedean screw without disturbing the sitter.

In one or two cases, where a dark red beard had to be dealt with, it received a judicious touch from the puff and powder, to secure detail. The time of sitting of each of the gentlemen on the same morning was about twenty-five seconds. Comparatively little modification of the light appears to be necessary in ordinary work. The expanse of stippled glass in the skylight gives a soft general illumination, and prevents the existence of any black shadows without detail. The clear side-light then gives a pronounced character to the principal lights. Where great vigour and contrast are required, the blinds are drawn so as to contract the space of clear light; and where a softer and more quietly harmonious effect was desired, the lateral expanse of side-light was increased by withdrawing the blinds.

In dealing with gentlemen, as with ladies, the sculptor was apparent in the operation. Each fold in a coat was carefully considered and arranged so as to receive a definite light, and cast a shadow. The idea of the sculptor manipulating his modelling clay was again manifest. So far as the brief space of time which a photographer possesses with his client permits, M. Salomon aims at producing what strikes him—and his perception is keen and rapid—of the characteristic traits of his sitters. On the young English girl he aimed at simplicity of effect; in the matron he sought more of graceful dignity. In a journalist, whose portrait was taken whilst we were present, he aimed at more severe dignity of style. A cloak of port wine-coloured velvet was thrown over one shoulder, and the column was, for the only time during our visit, brought into requisition, and prevalence of vertical lines, with a tendency to squareness instead of curves, prevailed in the composition.

As we have before said, and as is shown in the diagram in our last, the camera is always in the corner next the side-light, whilst the sitter is nearer the middle of the room. It is to be observed, however, that although the background is placed so as to partially front the side light, the sitter never faces it, but is invariably quartered in greater or less degree from it, the soft top light preventing, as we have said, black opaque shadows on the retiring side, which is turned from the dominant light.

Although deeply interested in his work, and sparing no pains in making an effective picture and characteristic likeness, scarcely ever using the same accessories on two pictures in succession, M. Salomon is rapid in obtaining results, chiefly because no time is wasted. There is no changing of position, and every touch in arrangement tells; and whilst there is no stern adjuration to keep still, but a cheery and humorous series of remarks, continued often during the exposure, there are few cases of movement. During little more than three hours of one morning, when we were present, not less than eighteen large plates were exposed, and a negative technically good in each instance obtained.

Our visit on this occasion has extended quite long enough, and we have minutely detailed operations; not because in much that we have described there is anything strictly new,

but because we know that so many readers are anxious to know every point in the operations by which such magnificent results are produced. We must, however, defer a few farther particulars of interest until our next.

SERIOUS FIRE AT MR. CLAUDET'S STUDIO IN REGENT STREET.

A SAD illustration of the gregarious character of troubles has just occurred in the disastrous fire at Mr. H. Claudet's studio on the evening of Thursday, the 23rd instant, just one month after the sudden death of Mr. Claudet, senior. The fire was discovered between nine and ten at night, within three hours after the premises had been closed and left by some of the assistants; and although it was speedily got under, it was not until enormous and irreparable damage had been effected.

We visited the ruins a day or two ago, and have rarely seen a more distressing spectacle. The reception room was one of the most elegantly decorated and appointed rooms in London, and cost the elder Mr. Claudet years of thought and effort, besides a very large amount of expense. The paintings in the panels, of allegorical and emblematical subjects in keeping with the place, designed and painted under Mr. Claudet's instructions, by a clever French artist, cost upwards of four hundred pounds, and the decorative fittings of the place nearly three hundred more. These are now simply blackened and blistered canvas and ashes. A couple of magnificent table stereo stands, magnificently carved by Harry Rogers, which cost two hundred and fifty pounds apiece, are now simply a few pieces of charred wood; and scattered near, a number of Daguerreotype plates on the surfaces of which, here and there, a portion of a ghostly face is seen amid the half melted metal, the sole remains of some exceedingly choice and carefully coloured stereoscopic portraits of beautiful women. The walls and stands and glass cases were crowded with very elaborately finished specimens in water colours and oil, many of the latter enlargements; the whole of these are utterly destroyed. And, saddest of all in this part of the destruction, was every existing portrait of the late Mr. Claudet. Many of these had been taken at various periods of his life, and finished with much care by the painter. They had all been gathered together from different parts of the establishment a few days before, and put aside in the specimen room with a view to division amongst the members of his family; and every one is consumed. The whole of the reception room, in fact, and its contents, now form one scattered heap of ashes.

Passing thence through the office into the late Mr. Claudet's private room, both being on the same floor and behind the reception room, a still more melancholy loss is found. In this private room were collected the experimental results of Mr. Claudet's scientific life. From the first days of the Daguerreotype process Mr. Claudet had been an earnest, active, and successful experimentalist, and he was, also, a systematic conserver of the results of his work. In this private room were collected the examples of the various experiments in the Daguerreotype process, from the earliest portrait of himself—stretched on his back, because the plate required upwards of a quarter of an hour's exposure—down to the most recent illustrations of the value of accelerators. Here were Daguerreotype etchings; examples of the work of curious lenses; a large series of illustrations of the peculiarities of binocular vision, and the apparatus belonging thereto; illustrations of the various optical theories and mathematical contrivances which absorbed much of Mr. Claudet's attention. All these are utterly and irretrievably destroyed. Here, in a desk, also, were a number of documents, notes, and memoranda of experiments, historical data, &c., in which we fear that our readers have sustained the loss of some interesting records; for they were documents which Mr. Henry Claudet had recently been collecting for us, as the material for a memoir of Mr. Claudet and his

scientific labours, especially in relation to the early history of photography. These are unfortunately all burnt; some of the documents exist in duplicate, but others are beyond replacing.

Upwards of twenty thousand negatives are destroyed, many of them being those taken within the last two or three years. The dark-room and laboratory fortunately escaped, and the studio and apparatus, although injured, were not destroyed. The chief damage was confined to the reception room, business office, Mr. Claudet's private room, the waiting and dressing rooms, and the corridors. We are glad to learn that Mr. Claudet was assured; but much that is destroyed—such as pictures and decorations—were not assured, and much more is of a character which constitutes an utterly irreparable loss.

The cause of the fire is at the present moment a mystery. The firemen attribute it to the over-heating of hot air pipes; but the truth is, the establishment was warmed with hot water pipes, and the fire clearly did not commence at the fire by which the water is heated. Mr. H. Claudet is satisfied that the origin of the fire cannot be traced to these pipes, but is unable at present to assign to it even a probable cause. We believe that he will speedily open premises in the immediate neighbourhood to carry on his professional engagements. We are sure that he will have the sympathies of the photographic world under the accumulated trials which have overtaken him.

Foreign Miscellanea.

At the December meeting of the French Photographie Society M. Niepce de St. Victor presented the members with a copy of a new Memoir on Heliography, which he has just published.

At the same meeting, M. Auguste Brun called attention to an improved developer, containing sulphate of copper, which is said to bring out the most perfect detail in the negative; the use of pyrogallie acid is eschewed, and the solution prepared as follows:—

Water	...	...	1,000 cub. cents.
Double sulphate of iron and ammonia	...	...	40 grammes
Pure sulphate of copper	...	...	20 "
Tartaric acid	...	...	10 "
White gelatine	...	...	3 "

M. Brun likewise states that he has derived considerable benefit by adding a small quantity of white honey to his collodion; the honey is dissolved in a small quantity of alcohol, which is afterwards used in the preparation of the collodion.

The English correspondent of the *Moniteur de la Photographie* (Dr. Phipson) makes known a humorous suggestion, made to him by an officer in the army, with reference to an application of photography to military purposes. Instead of keeping a battalion of soldiers shivering on parade for a couple of hours while the muster-roll is being called over, it is suggested that a photograph of the men should be taken, which being afterwards examined by the Sergeant-Major by means of a magnifier would show the exact state of the ranks and who were the defaulters.

The *Photographische Mittheilungen* of January presents its readers with a photographic specimen printed upon Obernetter's collodio-chloride paper. The pictures are said to be very excellent examples of what can be done with the new material. But the most interesting circumstance connected with the pictures is the fact that the majority of them were produced by development, and these come so near in point of beauty to prints obtained in the ordinary manner, that it is difficult, even for practised eyes, to find any difference between them. The only way in which they materially differ from one another is on the reverse side of the prints, the backs of those produced by development bearing traces

of a few faint spots. The developed pictures were obtained by printing a faint outline, and developing the same with—

Water	...	...	...4,000 parts
Pyrogallie acid	...	...	... 2 "
Citric acid	...	...	1 to 2 "

If the operation of development proceeds too slowly, a few drops of silver solution are added; the picture is brought out vigorously, and afterwards washed, toned, and fixed in the ordinary manner. For printing by development the paper must be perfectly new.

A German Chemical Society is being formed in Berlin under the presidency of Dr. Hoffmann; Dr. Vogel and M. E. Sehering have been appointed on the Provisional Committee.

M. Malmström, of Skard, in Sweden, has forwarded to the Berlin Photographie Society a description of an apparatus used by him for operating with wet plates in the open air without the aid of a tent. It consists of a bellows camera, under the focussing-board of which is attached a box containing four vertical baths. The plate is collodionized, and fixed into the box. By means of an arrangement it is made to pass into the first bath to be sensitized; it is then exposed, and afterwards treated successively in the developing, intensifying, and fixing baths.

The *Mittheilungen* contains a detailed description of the studio and workrooms attached to the establishment of MM. Rabending and Monekhoven, at Vienna.

M. A. L. Neyt, in a communication to the *Bulletin Belge* on the preservation and restoration of negatives, asserts that he has discovered the true cause of the rising of the films. He states that in the majority of cases negatives are stored away in racks against a damp wall, and so close together that it is impossible for a current of air to circulate among them. The consequence is, that during damp weather, drops of moisture become deposited upon the plates, and remain there for a considerable period, long after warm dry weather has set in. It is for this reason that the injury to the film is always observed in the centre of the plates and not at the borders, which have a better chance of becoming dry. M. Neyt recommends the usual method of restoring negatives injured in this manner, viz., by subjecting them for several hours to the action of alcoholic vapour.

In the *Photographische Correspondenz* M. C. Haack describes the apparatus used by him when manipulating with dry plates in the open air. The construction is by no means of a novel description: an oblong box has an opening at each end for the insertion of the arms of the operator, and at the top is another orifice furnished with yellow glass to look through. There is, besides, a small window of yellow glass and a door opening into the apparatus, by which the box of dry plates and the dark frame are placed inside. With this arrangement the plates are easily removed from the box to the dark slide, and vice versa.

The *Photographisches Archiv* of last month contains no especial novelty.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER I.

"Trace me in the tedious ways of art."—*Shakespeare*.

"I have been looking over your books, and can find none but works on the most hopeless subjects:—'The Philosophy of the Beautiful,' 'Du Vrai, du Beau, et du Bien,' 'Cours d'Esthétique,' 'Kunst und Alterthum,' and other such like 'Kritische Walder.'"—*Pine Art Quarterly Review*.

THERE has been so much written on art in its relation to photography, which, when applied, has been found to be of very little use—so much talking, as Carlyle says, "from the teeth outwards," upon this matter—that it is with the greatest diffidence and reluctance I have consented to write, or compile, a series of papers on the subject. Their aim

will be to set forth the laws which govern—as far as laws can be applied to a subject which depends in some measure on taste and feeling—the arrangement of a picture, so that it shall have the greatest amount of pictorial effect, and to illustrate by examples those broad principles without regard to which imitation, however minute or however faithful, is not picturesque, and does not rise to the dignity of art.

In promising, at the outset, to be as practical as possible, I know I am sacrificing some advantages to myself, and much ease of writing, besides the *écrit* that often follows and rewards the inventor of grandly-sounding sentences, easy to write, but difficult to read, and still more difficult to understand. Those who represent art as a kind of mystery, an inspiration, a gift of the gods to special favorites, often receive the credence of the ignorant, as, in assuming the language of the oracle, they are supposed by the uninstructed to possess the inspiration, and hence, until the imposture is discovered, they receive more attention than he who endeavours to show that there is a pathway open in the direction of the temple of art which all may tread, even if all do not reach the inner sanctuary. Notwithstanding all this, my object will be to write as clearly and definitely as possible, that I may be understood by, and be of use to, all who honour me with their attention.

Many works have been written on the Art of Composition. A series of articles on the subject, of especial merit, by Mr. Lake Price, who is well known as a painter and photographer, appeared in the early volumes of the *Photographic News*, but no work has hitherto been published that sufficiently applied—or, indeed, attempted to apply—especially to photography.

In this series of papers I shall have not a word to say on the poetry of art; that is a question on which it is difficult to write so as to be really understood, except by those who have had a long education in art. I shall confine myself to what may be called the construction of a picture: in fact, I propose to deal with the body, or perhaps the skeleton, and not the soul; with the tangible, not the intangible; with that which can be taught, not that which must be felt. Neither shall I attempt to go into the mysteries of the science of composition, which only can be of use to painters who have command over every line that appears in their works. Photographers, although a wide scope for artistic effect is open to them, have not the facilities which other artists possess of making material alterations in landscapes and views embracing wide expanses, neither have they so much power of improvement in figure subjects, although much may be done by skill and judgment in that way; but they have open to them the possibility of modifying, and, being free agents, they have the power of refusing to delineate, subjects which by no efforts of theirs will ever make effective pictures. It is a too common occurrence with photographers to overlook the inadaptability of a scene to artistic treatment, merely because they think it lends itself to the facility which their art possesses of rendering minutiae and unimportant detail perfectly. To many this rendering of detail and the obtaining of sharp pictures is all that is considered necessary to constitute perfection; and the reason for this is, that they have no knowledge of, and therefore can take no interest in, the representation of nature as it would be presented to the eye by a well-trained painter.

It must be confessed, and distinctly understood, that photography has its limits. Whilst it will be necessary to explain the laws of composition in their entirety, the applicability of these laws in photography is limited by the comparatively scant plasticity of the photographer's tools—light as it can be employed by lenses and chemicals. Therefore, as I proceed with the rules of composition as far as they have been reduced to a system, or rather a *quasi* system, it will be my aim to endeavour to indicate what can be done by photography, and how; assuming throughout, however, that the student is familiar with photography and the capability of the appliances at his disposal. In doing

this, I shall bear in mind the Italian proverb, "He is a fool who does not profit by the experience of others," and shall not hesitate to avail myself of hints from every author I have met with who contains ideas worth placing before my reader, illustrating my remarks with engravings from the works of well-known painters, with occasional sketches of photographs in which the principles defined by the art of composition have aided the photographer in his choice of subject, in the arrangement of his sitter, or in his management of light and shade.

Some might ask, Of what use would a knowledge of pictorial arrangement be to photographers who have, especially in landscape and architecture, to deal with subjects over which they have but little control? To admit this would be to deny that the works of one photographer were better than another, which would be untrue. It must be admitted, by the most determined opponent of photography as a fine art, that the same object represented by different photographers will produce different results, and this invariably, not only because the one man uses different lenses and chemicals to the other, but because there is something different in each man's mind, which, somehow, gets communicated to his fingers' ends, and thence to his pictures. This admitted, it easily follows that original interpretation of nature is possible to photographers—limited, I admit, but sufficient to stamp the impress of the author on certain works, so that they can be as easily selected and named by those familiar with photographs as paintings are ascribed to their various authors by those who have an intimate knowledge of pictures. To make this quite clear, I will dilate a little further on this subject, for it is of importance, at the outset, to prove that superior results are produced by superior knowledge, not only of the use of the materials employed in photography, but by an acquaintance with art, or the whole purpose of the present treatise falls to the ground.

Given a certain object to be photographed by several different operators: no exact point of sight shall be indicated, but the stand-point shall be limited to a certain area. What will be the result? Say there are ten prints: one will be so much superior to the other that you would fancy the producer had everything—wind, light, &c.—in his favour; while the others will appear to have suffered under many disadvantages. This picture will be found to have been taken by the one in the ten (and, I fear, that proportion is too large) who has been a student of art. By his choice of the point of view, by the placing of a figure, by the selection of the time of day, or by over-exposure or under-development, or by the reverse, producing soft, delicate, atmospheric effects, or brilliant contrasts, as may be required, the photographer can so render his interpretation of the scene either a dry matter-of-fact map of the view, or a translation of the landscape so admirably suited to the subject, as seen under its best aspects, as to give evident indications of what is called feeling in art, and which almost rises into poetry; the result often differing marvellously from the horrors perpetrated by means of our beautiful art in the hands of those who only know that if a piece of glass is prepared and treated in a certain manner, it will result in the production of an image of the object which has been projected on the screen of the camera by the lens.

It is not only the cultivated and critical eye that demands good composition in works of art, but the ignorant and uneducated feel a pleasure—of which they do not know the cause—in a sense of fitness and symmetry, balance and support.

BLISTERING OF ALBUMINIZED PAPER.

WHY do albuminized prints sometimes blister after fixing?—a question that has been often put to editors of photographic journals, but the reasons given have been, I think unsatisfactory.

I propose to give you what I consider, from repeated experiment and observation, to be the primary and true cause.

Years back, before the carte-de-visite mania, Rive paper was the only kind found to blister; but with the carte-de-visite came the general desire to have more highly-albuminized paper, more gloss, and more brilliancy in the prints. Consequently, of late years, all papers, either Saxe or Rive, have been (during the summer months) occasionally liable to blister. I say consequently, as it is just the highly-albuminized sample which is most prone to the defect, because the albumen is most difficult to coagulate.

The remedy is, *thoroughly coagulate the albumen on the paper*, then try your best, and you cannot produce blistered prints.

Certain conditions are required to produce blisters; viz., a thick, dry, horny film of albumen, and either a weak solution of silver or a short time of floating; just as you avoid these, you avoid blisters.

I had some paper last summer the albumen on which was very difficult to coagulate with silver solution then in use; it blistered so perfectly that the film of albumen could be easily stripped off the paper. I at once procured some prepared with diluted albumen, and lost some gloss by the change, and lost sight of blisters also. The troublesome paper was laid aside until we had a week or two of damp weather, when, it being less dry and horny, the silver solution easily permeated and coagulated the albumen perfectly, and the prints done on it were free from blisters.

I have just secured Mr. Hughes' "Curious Experience" in the PHOTOGRAPHIC NEWS ALMANAC. He does not record the strength of the silver solution he used for his double-albuminized paper; but for such I should use a very strong solution. If Mr. Hughes is tempted to try again, and could sensitize the paper soon after albuminizing it, and before the albumen got too dry and horny, he would succeed better; or, if he was disposed to try spirit again, try it thus: float or sponge the back of the paper with the spirit, so as to soak it enough to coagulate that stratum of albumen lying next the paper, and, without drying it, sensitize on a strong silver solution, and he will probably succeed still better. But, in coagulating albumen with spirit of wine, it must be borne in mind that the spirit is a mixture of absolute alcohol and water, and that it is the absolute alcohol that is abstracted from the water in the process, and to so great an extent that the spirit is quickly reduced below coagulating power; hence Mr. Hughes' curious experience.

Again, when Mr. England read his paper on "A Modification of the Collodio-Albumen Process," a member considered the final silver solution too strong. Mr. England replied that he had tried a weaker solution, but the film blistered, but with the stronger solution the film was free from blister. Was it not because the latter coagulated the albumen? Subsequently, I believe, Mr. England has reduced both silver solution and albumen (both in due proportions) with a like result.

To conclude: the albumen, whether on paper or glass, *must be completely coagulated*, or blisters will result, as uncoagulated albumen is soluble in the various solutions subsequently brought into contact with it, and thereby loosening and ultimately detaching the superimposed films from the underlying paper or glass. VESICULA.

THE PRODUCTION OF PHOTOGRAPHIC ENLARGEMENTS.

BY D. WINSTANLEY, JUNR.

[We are favoured by Mr. Winstanley with a copy of his paper recently read before the Manchester Society, with some subsequent additions and modifications.]

The subject I had in view when I promised to read a paper before this Society was the production of artificial light for the purposes of photography, by the combustion of phosphorus vapours in an atmosphere of oxygen gas. Having experienced considerable delay in the construction of the apparatus necessary for carrying out my experiments,

I am unable to bring that subject before you this evening, and have, consequently, been compelled to select another.

At the present time, when enlarged photographs are rapidly making their way into popular favour, it seems to me a few words on the method of their production will not be uninteresting to the members of the Manchester Photographic Society. The truthfulness of a painting which has such an accurate production for its basis is no small reason for preferring a coloured photograph rather than the picture which depends for its similarity to the original entirely upon the skill of the artist. It is unfortunate, however, that our confidence in the continued beauty of a finished enlargement should be rudely dashed aside by our knowledge of the very questionable variety of permanence which, in the present state of photographic science, is all that can be expected from any picture having its origin in the decomposition of the salts of silver.

Just as the camera obscura—modified, indeed, to a greater or less extent in all its parts, to suit the particular exigencies of any individual case—is really the chief instrument required in the production of a photographic negative from nature, so the magic lantern, under various modifications, is the most important piece of apparatus used in making an enlargement from a negative.

The small picture being placed in the shorter of the conjugate foci of a portrait combination, or other suitable form of objective, and illuminated from behind, its enlarged image is projected on to the plain surface placed for its reception in the other focus; and this image is then impressed upon the paper or canvas intended as the foundation of the ultimate picture, either by out-and-out printing on chloride of silver, or by the actinic formation of a feeble or even an invisible image, which is subsequently brought out and intensified by the process of development.

When any considerable amount of amplification is required, the illumination of the enlarged picture is so much inferior to that of the small one that, in order to obtain any photographic effect in a reasonable time, it becomes necessary that the small picture should be illuminated more powerfully than is possible by the diffused light of day. The earliest instrument by which this was successfully effected is that known as the solar camera, which consists essentially of a box containing the slide for the negative, the objective, and a large lens for condensing the light, together with some mechanical appliances for moving the whole arrangement, or a mirror attached thereto, so as to allow of the sun's rays always falling upon the condensing lens, in a line at a right angle with the plane of its diameter.

That form of instrument in which this object is effected by the movement of the mirror is, I believe, generally conceded to be preferable to the other, as by its use the drawing-board employed to hold the paper during the enlarging operation always occupies the same angular position in the room.

The quadrant movement usually supplied with solar cameras for altering the position of the mirror is, to say the least of it, unsound in principle and inconvenient in practice. It frequently causes, from its imperfect action, the formation of a multiple image, and is soon rendered worthless by use from the inequality of the strains on its working parts.

That arrangement in which the mirror is supported by two substantial pillars springing from a revolving disc is infinitely to be preferred, because it is not encumbered with the defect just alluded to. To be really efficient, however, the movement of a solar camera should undoubtedly be automatic. Such a movement in actual working order I have never seen. Some time ago I had an arrangement constructed specially for this purpose, substantial enough to hold its mirror in position against a strong wind, and sufficiently delicate in its mechanism to require no more impelling force than can be furnished by a common Dutch clock. Circumstances having rendered the completion of the instrument unnecessary, and it being the property of a gentleman who

prefers to keep it in its present state, I have not had the satisfaction even of seeing this at work.

Many persons might be tempted to suppose that the illumination of the negative, by allowing the sunlight to fall upon a piece of ground glass in front of it, would be a convenient way of effecting that object. Experience has, however, shown—and, indeed, a very little reflection would determine—that this is by no means the best method that could be adopted.

The transmission of a cone of rays, converging to a point in the optical centre of the objective combination, through the transparent picture to be copied, is generally admitted to be the best method of illuminating a picture, the projected image of which it is intended to photograph.

When artificial light is made use of, a condensing lens of much shorter focus becomes requisite, because the artificial rays diverge, whilst those of the sun are parallel; and this shortness of focus is much more imperatively necessary, if the lens is intended to work in the same camera which is employed with solar light.

Which is really the very best possible kind of condenser that can be employed is a very difficult point to determine. I have made experiments with many varieties myself, and give my own preference to one of three elements; viz., two plano-convex mounted with the curved sides together, and a meniscus as the immediate recipient of the artificial rays, which are allowed to fall upon its concave surface. Such an arrangement is, beyond a doubt, far ahead of a combination formed of the two convex lenses alone.

If I were asked the question—Which is the best light that can be used for enlarging purposes? I should, without hesitation, answer that of the sun; for when it does shine uninterruptedly its light is vastly more convenient to work with than either electric, lime, or magnesium. Of artificial lights, however, I consider the lime as the most generally useful, because it is much less costly to produce, and more steady to work with than either of the others mentioned.

Many persons have, without hesitation, pitched upon one or other of the three sources of artificial light mentioned, as being much more brilliant than either of the others. Any assertions, however, which have been made on this point are wholly unreliable, inasmuch as *no quantitative scientific determinations have ever been made to decide the question*; and, if they had, it is by no means improbable that the present elementary and more or less unsatisfactory state of photometrical science might yield an answer to the question which, at some future time, would be shown to be more or less incorrect.

Any quantitative determinations, however, even though based upon a method more or less faulty, are infinitely preferable to those vague statements which have confidently fixed the choice of three in succession upon each one of that number.

To compare one light with another, without specifying exactly under what circumstances each is produced, is almost too ridiculous and stupid a thing to merit criticism.

The intensity of the electric light, for instance, may be increased at will ten, fifty, one hundred, nay, a thousandfold, or even more, by a sufficient increase of battery power when the light is produced by chemical means, or by a corresponding accession in the number of revolutions made by the armature, or in the increased length of the coil or the power of the magnets in an electro-magnetic machine. So, also, by an increase of the pressure on the gases, by a larger orifice of the jet, or by a superior quality of the calcium preparation, the intensity of the lime light may be enormously increased.

To return, however, to the application of these lights to the purposes of photographic enlarging. The objections to the electric light are—the trouble of working the batteries when its origin is galvanic; the wearing and consequent breaking down of the apparatus when it is produced by mechanical means; and the movement of the carbons, caused

by inequalities in their composition—a movement which no lamp, however ingenious in its construction, can obviate.

The objections to the lime light are—that it requires almost constant personal attention (at all events, in the absence of more perfect appliances than those at present in use); that the cakes or discs are apt to fall in pieces; and the inconvenience of making gas.

The objections to the magnesium light are—that its flame is either too large for optical purposes, as in Larkin's lamp, or moves too much, as in the American lamp.

This latter objection is not necessarily fatal to the definition of the picture; but, when it is not, a very large percentage of metal is consumed without producing any photographic effect.

Some time ago, when making comparative experiments between the lime and magnesium lights for the purpose of photo-enlarging, I obtained a print by the use of the latter light in fifteen minutes, "the lamp consuming fifteen feet of ribbon, weighing three grains to the foot, and selling at that time (March 29th, 1867), at 10s. per ounce. Upon another piece of the same sheet of iodized paper, silvered for the same length of time with the same silver solution, another enlargement was produced, without moving either the negative or the board by means of the lime light, which occupied exactly the same place as the magnesium flame did in the preceding experiment. The paper was exposed until just about the same amount of trace was visible upon it. The time was then noted, when, singularly enough, it turned out to be just fifteen minutes also. Both prints, after half an hour's development, presented an exactly similar appearance. During the lime light exposure the gases (pure oxygen and carburetted hydrogen) were under a pressure equal to that exerted by a column of water seven inches in height. The temperature of the room was 65° Fahr., and the burner from which the mixed gases issued allows 6 cubic feet of oxygen and a combining quantity of carburetted hydrogen to pass in two hours and a half, under 7 inches' pressure.

Under the circumstances of the trial, which were very fair ones, my own opinion with regard to cost was decidedly in favour of the lime light. With regard to this latter light, by-the-by, allow me to mention, in passing, the fact that gas bags are, when in daily use for commercial purposes, of very little genuine utility, because of the constantly-varying pressure to which, from the very nature of their construction, their contents are subjected; and they are, moreover, a very prolific source of vexation and disappointment. Beyond a doubt, before long, they will be almost entirely superseded by cylinders—hydraulic ones for stationary use, and condensing ones for transportation.

Having now spoken on the mechanical, the optical, and illuminating appliances needed, I will say a few words, in conclusion, on the chemistry involved in the production of prints by development, and briefly remind you of the peculiar variety of negative yielding the best results.

Iodide, bromide, and chloride of silver are the sensitive salts which, under various circumstances, individually and in all proportions of admixture, are used for the reception of the actinic impression. When the alkaline salts of the metaloids contained within the substances mentioned are mixed together, according to the order in which I have enumerated their silver compounds, and dissolved in water in about the proportion of 4, 1.25, and 1 to 100 parts of water, the most sensitive film is obtained. The image, however, acquires its full vigour with reluctance, and frequently requires intensification with gallic acid and silver. When bromide and chloride are used together in the proportion respectively of four and two per cent., a prolongation of exposure results, but with the merit of an easier accession of density. The chloride alone gives the richest modelling and depth, but is the most insensitive.

Everyone, of course, will understand that, under the circumstances to which the foregoing remarks apply, a sheet of paper is used for the reception of the picture. Paper itself is a substance which varies enormously, from the

absorbent filter paper to the waterproof enamel. The sensitiveness of the preparation greatly depends upon the paper used, and the difference from the slowest to the most rapid, on this account alone is as much as 1,600 per cent. on the latter. The fine photographic papers are, with the same preparation of iodine and silvering, just about so much more sensitive than the heavy drawing papers, which latter, however, yield by far the most beautiful prints. When under-sized papers are used, the image invariably sinks within them, which objection to the finished prints may always be removed by strongly sizing before iodizing. This may be accomplished by a sufficiently strong solution of clarified gelatine, which is the better for being altered by the action of tannic acid, or the sulphates of iron and alumina, after pouring on the paper.

The peculiar bloom and brilliance, however, of some prints (as, for instance, the one I now show you) depends upon the perfection of the balance in time and materials used in the production of the picture, and which varies with every negative and temperature. The print I now hold before you is as perfectly upon the surface of the paper as the other one; but in its production the chemicals and exposure were not as nicely balanced, and it therefore lacks the bloom.

Prolonged exposure, under-development, and a small proportion of the salts of iodine in comparison with those of chlorine, all tend to make the picture red; whilst a slaty colour is obtained by the reverse of these. Red pictures, however, may always be toned after fixing by an alkaline solution of gold.

From sixty to seventy grains of nitrate of silver to the ounce of water, with a drop or two of acetic acid, is a convenient formula for the silver solution, which is best applied by brushing over the paper with a strip of swan's-down cotton, using the smallest proportion of silver required. The purity of the silver bath is one of the most essential conditions required in the production of clean work.

The development and fixing are effected by the use of saturated solutions of gallic acid and hyposulphite of soda. The amount of exposure required varies, with circumstances, from three seconds to a couple of hours.

The best kind of negative is one which has been fully exposed, developed without fogging, and left entirely unintensified. In fact, merely a slightly over-done positive. The process of enlarging by the lime light and by development is one of much more certainty than is generally imagined. I seldom have more than three or four per cent. of failures, and frequently obtain quite up to the mark without retouching.

The sundry imperfections of arrangement, style, and diction, which you will have perceived in this paper I trust you will look upon leniently when I tell you that it was written after a tedious day's work, at a late hour last evening.

I have no doubt, however, that with all its imperfections on its head, it will have excited amongst you some little amount of interest in a process which, when applied to portraiture, adds to the rational luxuries of our home; and, when used for the delineations of morbid anatomy, assists the medical student in acquiring that knowledge of disease which often enables him, in his professional career, to arrest and overcome a malady ere it becomes necessary for the preservation of vitality to afflict the suffering patient with "the terrors of the knife."

LECTURES ON ART.*

In commencing the second lecture, and urging upon those who really take an interest in art the value and importance of education in its principles and position, the lecturer said he had, on the last occasion, referred to it as a means of increasing their enjoyment in looking at works of art, and of giving them self-reliance in forming a judgment on the merits

of a picture or a piece of sculpture. He should endeavour to place before them the various recommendations that a study of art possesses beyond its charm as an exponent of sentiment or of beauty, whether in form or colour. The public was not only generally uneducated in practical art, but it was equally uninformed in its history and the important functions it fulfilled as a contemporary record of the state of nations and of their civilization, when the more ancient works were produced. As illustrations of the condition and habits of the people amongst whom it was, in its first ages, practised, the remains of old time had an interest far beyond what any modern art could offer. Monuments of sculpture, especially, were, at one time, the only records of memorable events. They portrayed the great acts of kings, heroes, and conquerors. They marked important historical incidents; and from them we had acquired an insight into the mythology and the poetry of the ancients. In these representations we had most curious and reliable authority for the costume and habits of remote nations of whom there was no written or other recorded account. Here, then, they stood out with an interest entirely their own, and independent of any recommendation as regarded art excellence. There could be few present who had not seen the sculptures from Egypt, Spain, Hindustan, and from early Greece and Asia Minor, now collected in our British Museum. Some of these were of extraordinary antiquity, and we felt grateful for their preservation, while we stood, with a feeling akin to veneration, before works executed long prior to any written history. The monuments of Egypt probably mounted up to not less than 2,000 years before the Christian era. The sculptures brought from Nineveh and its neighbourhood exhibited a comparative perfection of workmanship that showed long practice; yet we knew that the wonderful city from whose ruins they were exhumed was utterly destroyed above 600 years before Christ. This comprehended a period of nearly 2,500 years, and many of the sculptures must have been executed long before this event. Incidentally, the peculiar symbolic treatment of these monuments was explained, in the union of intelligence, force, and motion or activity, in the colossal and other figures where the human head appeared joined to the powerful muscular body and legs of the lion or bull, while enormous wings expressed the capability of rapid motion. The sculptures of the Parthenon from Athens, though not amongst the earliest works of Greece that might be referred to, had also that extra interest which was afforded by the certainty that from the age of Pericles all the greatest men of ancient classical times—generals, poets, historians, philosophers—had contemplated and doubtless admired those very productions. In the larger number of the older works of Assyria and Egypt there were the most minute representations, both in painting and sculpture, of the everyday habits of the different nations; their wars and conquests, their amusements, their occupations in handicraft, their building, boating—in short, all the various business of life. Here, surely, was sufficient to give an absorbing interest to representative art, simply in its function of illustrating human life and progress.

The lecturer then proceeded to give a rapid review of the different schools of sculpture from the most ancient period; and took occasion, after still further extending his survey, to return to the proposition with which he set out—namely, that there were many grounds of interest to recommend art to the attention of thoughtful and cultivated persons beyond its attractions as a means of mere representation or imitation, and as the outward expression of sentiment and beauty. He concluded by hoping he had succeeded in impressing this fact upon many present who, probably considering painting and sculpture only in an objective point of view, had not carried their interest in it beyond the pleasure it was capable of affording them as material art. This, of course, in these days was a great purpose of painting and sculpture; but the earlier function it fulfilled gave a dignity and character to its history which deserved the recognition of all persons of reflection and education. The higher the estimation in which any object was held the greater its interest and the reason of its attractiveness to all persons of sensibility and of cultivated minds. The lecturer said his purpose in dwelling on the uses and application of art in the earlier ages, its history and progress, independently of its material charm, was to incite this extra interest. He should be very glad if anything he had said or might say on this subject should be the cause of inducing those who attended his discourses to feel the importance of education in the history and principles of art; and to acquire themselves—and, if they had the oppor-

* Continued from p. 11.

tunity, to extend to others—the knowledge which would so surely open to them a wide field of intellectual enjoyment and delight.

He commenced the third lecture by repeating his remarks that it seemed to be agreed that, as regards art in England, the great want of the present day is education. To induce people to care to be educated they must be interested; and it was to show them there was this interest in art beyond its material attractions that he had dwelt on the important functions of ancient sculpture, and its history and progress from the fifth century before the Christian era down to its decline in the late Roman period. To bring the subject more home to modern feeling, he should now make a rapid survey of its history from the revival to the end of the last (the eighteenth) century. It is, however, scarcely correct to call this a revival. It was rather a new birth, so different and distinct was it from the older art in its material presentation. It had one advantage in common with most archaic sculpture. Its impulse was religious, but materially it had no beauty. The neglect of ancient examples in this particular—for remains of fine works must have abounded, to say nothing of the living Nature before their eyes—suggests that this proscription of the beautiful and even ordinary true forms was intentional. The avoidance of this in Pagan art is quite intelligible in the professors of the new and purer faith, but scarcely so the willing adoption of decidedly ugly and ill-proportioned forms. The controversy which raged so long between the Eastern and Western churches throws some curious light on this subject. The former insisted that sacred personages should not be represented beautiful and attractive; and even the figure of Christ was to conform to this rule, inasmuch as it is said in Isaiah, "He hath no form or comeliness," &c. The Western church advocated the opposite doctrine, and the result is seen in the art that grew out of the two systems. The ecclesiastical art of the present day, in the former cradle and school of the beautiful—the East—is as rude and gaunt as it was in the earliest time; while in the West the contrary principle, afterwards established by the authority of Pope Adrian, led to the subsequent excellence of the school of Italy. The earlier painting and sculpture employed in the Gothic period scarcely deserves the name of fine art, wanting as it is generally in almost all art qualities. It is true it was only used for decoration; but still it professed to imitate something, and this should have been Nature. The contrast, as regards the accessory art connected with Gothic architecture, is remarkable when compared with that employed by the great Greek artists—in the Parthenon, for instance. Here the most perfect architecture of its kind was enriched with expressive sculpture of the most perfect forms in nature; and it is this combination or union that constitutes the highest form of art. The short duration of Gothic architecture, and the constant changes it underwent, may account, in some measure, for the incompleteness of the imitative arts in connection with it. It must be borne in mind that in the short space of about three hundred years it passed through many phases—from the Romanesque to the pointed or early English style, from that to the florid or decorated, and then to the perpendicular, when it may be said to have collapsed altogether. No person of sensibility, or who has any genuine feeling for the beautiful and picturesque, can deny the charm, or altogether resist the fascination, that is found in the best examples of true Gothic architecture. But there is, unquestionably also, a positive claim to admiration in the originality, the bold fancy, the variety and play of parts, the contrivance of scenic effects in the perspective views, and in the striking contrasts in *chiaroscuro*, which are so remarkable in the monuments of this peculiar style of art. Still, with all these admissions, the lecturer said he was bound to protest against the outrages committed against truth and fitness, and, indeed, common sense, which were so constantly seen in the Gothic use of accessory imitative art. How the fitness of nature was abused is seen when human faces of saints, kings, nuns, and ecclesiastics are found employed as corbels and brackets to bear weights, or as terminations to dripstones, or as gurgyles or draining-pipes; or when entire or truncated figures, angels or others, are seen suddenly starting from walls; their drapery clinging to them in stiff, horizontal folds instead of falling by any law of gravitation; or standing figures thrust into arched, hollow mouldings; or others dislocated and distorted to accommodate them to fill up spandrels of arches or other spaces. Still there was a promise of excellence in this Christian art, and there were signs of improvement of the most encouraging kind. Unhappily, a revolution, fatal, as it turned out, to the

progress of art, changed the character of the age. This was occasioned by the passion created for classical studies by the discovery of manuscripts and remains of Greek and Latin literature in the fifteenth and sixteenth centuries. The educated and influential classes devoted themselves to this new attraction, insisting that everything should be done to establish a pseudo-classical taste, and by the end of the eighteenth century all true art-sentiment seemed extinct. This was the state of art when Flaxman and Canova stepped in to stem the torrent of false and bad taste.

Mr. Westmacott concluded with some remarks on the late rise of art in England compared with other countries—Italy, France and Germany. In the course of these, and in commenting on the inferiority of English art, he exposed the absurdity and unfairness of the charge that the Reformation was the cause of a retrograde movement in art among us. England had no art to retrograde or to be injured at that date. All, or almost all, we had was by foreigners, who were certainly free from the supposed influence of the Reformation. They brought here the bad style of art universally prevalent on the Continent—that is, their own. In the churches of Italy, and in St. Peter's especially, the very worst taste prevailed, as may be seen in the meretricious, and sometimes even offensive, art that was allowed to appear there in ecclesiastical buildings. Certainly we had nothing of our own of this kind, whatever shortcoming in other respects might be laid to our account. The lecture closed with some general observations on the general tone of art-feeling in England at the present time.

Correspondence.

HYPOSULPHITE OF AMMONIA.

SIR,—In reference to the communication from Mr. Spiller in the last number (No. 499) of the *Photographic News*, on "Hyposulphite of Ammonia for Fixing," allow me to observe that the whole account of the experiment cited from "Colin Mackenzie's Treatise—One Thousand Chemical Experiments, &c.," on the action of hyposulphite of ammonia on nitrate of silver, is copied *verbatim* from my second paper on the hyposulphites in Brewster and Jameson's *Edinburgh Philosophical Journal* (1819), p. 396.

Mr. Spiller appears to consider the insoluble powder formed by adding chloride of silver to the solution first described, as pure hyposulphite of silver. It is, however, more probably a compound of that salt with hyposulphite of ammonia, atom to atom; the soluble double-salt containing two atoms of the silver-salt. Such, at least, is the view taken in the next paragraph (not copied, apparently, by Mr. Mackenzie). It runs as follows:—"29·3 grains of the soluble variety above described gave 11·9 sulphuret of silver, which agrees, within moderate limits, with a composition of two atoms of hyposulphite of ammonia + one atom hyposulphite of silver. Hence it is very probable that the insoluble variety consists of the same component salts, united atom to atom."

To procure the pure hyposulphite of silver, nitrate of silver, somewhat diluted, must be poured into a pretty strong solution of hyposulphite of soda. A copious precipitate falls—white at first, but, as the precipitation proceeds, becoming gradually dirty, and at length quite brown, especially if too much of the nitrate be added. This precipitate, separated by the filter and washed, must be treated with ammonia, which dissolves the metallic salt, but leaves the sulphuret behind which contaminated it. The ammonia being exactly neutralized by weak nitric acid, the salt precipitates in a snow-white powder, which must be separated and dried as quickly as possible by violent expression between folds of blotting-paper." The sweetness of the soluble ammoniacal salt is something astonishing. Fifteen grains of white sugar communicate a barely perceptible sweetness to 4,000 grains of water. The sweetening power of the silver compound, therefore, exceeds that of sugar in the proportion of 120 to 1.—I am sir, your obedient servant,

J. F. W. HERSCHEL.

Collingwood, January 25th, 1868.

MR. McLACHLAN'S DISCOVERY.

SIR,—Since reading Mr. Lachlan McLachlan's letter in your last number, I have felt, as it were, as if the ground were cut from under my feet; and, with your permission, I shall beg, on public grounds, that that gentleman will reconsider his determination, as others may be suffering in a like manner. Although I have been working assiduously for years at photography, it seems that all that is known as yet is mere moonshine to what Mr. McLachlan can show us. The question immediately arises, why proceed a step till he has mercy on us? We (photographers) and the public may at once cease in our present hit-or-miss style, and await the revelations of our benefactor. Second sight is generally considered to be the privilege of that land where Macs abound. But, sir, will this gentleman be so hard on the world as to delay till July or August the full taste of those joys of which, as yet, he merely hints his possession? "There's many a slip 'twixt the cup and the lip." He might (Heaven forbid!) die. Have not thousands mourned the precipitancy of that Roman emperor who slew the artificer that brought him the malleable glass vase, and said he had not confided his secret to others? Are there not advertisements in every paper that "accidents will happen?" What office could insure his life, plus our hopes? Has not some one said,—

"Where'er I go, where'er I roam,
A voice still whispers in my ear,
This earth is not thy home?"

In fact, the arguments are endless that might be brought to bear upon my view. In olden times, when any Mac had celebrated himself, his countrymen, as they passed his resting-place, threw a stone on the heap, and at length the mass testified by its size the respect that posterity bore him. The cairn, as it was called, should be enormous in Mr. McLachlan's case, if he performs half he promises; and I am mentally putting aside a guinea or two for the inevitable testimonial. Mr. McLachlan differs "very materially with the first chemists and photographers of the day." So I am putting in a heap—Fresenius, Hardwich, Bolley and Paul, Lake Price, Fownes, Towler, Galloway, Hassell, Faraday, and others, for a bonfire, for they never promised half as much. He also says, "Should I be mistaken, I would like to have my error pointed out to me."

Sir, to keep his mind easy. I may, I think, with some confidence, assure him, on the part of photographers, that it will be. And for his noble offer, I would remind him of that line of Virgil's that might with justice be claimed by photographers as their motto,—

"Sic vos non vobis mellificatis apes."

Sir, I cannot go on, the noise of the flourish of trumpets about me is so great.—Your obedient servant,
January 23rd, 1868. A MAD DOCTOR.

"CHEAP JACKS" IN PHOTOGRAPHY.

SIR,—Your correspondent "Litho," who evidently does not live in a glass house, or he would not throw stones, appears to hold the Cheap Jacks in very orthodox horror.

Sir, I am a "Cheap Jack," and I practise "the five shilling cut." I am one of "that low lot," but I believe that most of my fraternity will join me in raising an emphatic objection to the inferences of your correspondent, who says: "They (the C. J.s) have done all in their power to disgrace photography." Sir, I deny this—every word of it. I am the last to agree with excessively low prices in anything. Cheapness generally means low quality; but, often, competition forces those who have small capital either to low prices or abandonment of their trade, which they may love to practise just as well as "Litho."

Portraits at a low price were introduced to supply the people. John Smith and Sarah Stoakes may not be good models—may be ugly and ungainly to the last degree—but there is no reason why they should not have their portraits

taken. If John has a regard for Sarah, he prizes her picture, and they have the same pleasure in gratifying their relatives, &c., as the highest class. The necessity for moderately low-priced photographs is evident, make them as good as you can; but "Litho" alludes to the "Cheap Jacks" as if they were the only photographers that have any sins to answer for. I think you yourself will bear me out that hitherto high prices have not uniformly meant artistic pictures, or even good manipulation.

Sir, I object to your narrow-minded correspondent. An art or profession should be open to all. Because I charge 5s., and "Litho" gets four times as much, does it follow that he is more "worthy" than me to participate in any discovery or improvement that may be made? Can I not have the same desire to obtain the best result that lies in my power and knowledge, and the same appreciation of the artistic as he has? In fact, am I not a man and a brother? If I am ignorant, teach me; but do not exterminate me.

Sir, I do not know Mr. McLachlan, only through your Journal, but I appreciate his offer as much as any photographer can do. Although he may be, as "Litho" asserts, my enemy and the enemy of all my compatriots, I beg to propose when Mr. McLachlan has proceeded to successful demonstration of his discovery, that he be presented with some suitable testimonial of his cleverness and generosity; say a piece of plate, or gold medal and clasp, subscribed for by all classes of photographers, not excepting "Litho;" and one of the first shall be—Yours,
H. S.

PS.—I beg to enclose my "card," which is a fair sample of general work; and I ask you, impartially, if it is not quite as well worth the price as most of the higher class people's work is worth their price? I can point to half a dozen photographers in this town, all at this price, whose work is better than mine. I find "the better the work the more custom you get," but you cannot get another shilling per dozen, however well they may be done.

[The print enclosed by our correspondent is decidedly above the average of excellence in card pictures; and we think our correspondent himself would admit that the price of five shillings per dozen does not adequately represent the value of the professional skill and other costs of production. The claims of John Smith and Sarah Stoakes to portraits of those whom they love, at prices within their means, are such as we shall not deny; but the extent and limit of those claims, and the mode in which they shall be supplied, open a wide question. We should not ignore their claims, but we should recommend that they should be supplied in a degree commensurate with the prices they can afford, exactly as all their other natural wants and desires are supplied. To do this it is not necessary that the general price of good work should be lowered for the whole public below a fairly remunerative rate in order to meet the wants of a class of small means. For instance, the card forwarded by our correspondent is not one of a person belonging to the class indicated, but one of a lady whose dress and appointments indicate the capacity of paying a fair price for a work of art. If the price were twice or thrice or four times that charged, John and Sarah might gratify their natural desire for good portraits of each other by limiting those desires to their means, and being content with (say) a quarter or a third of a dozen for five shillings. The question cannot be argued in a small space, but our correspondent must well know that in the town in which he practises his profession, the trade or profession has been ruined by a cutting competition in price, not for the benefit of the poor, but for the benefit of a class who have large means to expend in the gratification of their desires. He must know also that the tendency of the maxim of quick returns and small profits in matters of art tends to haste and slovenliness, that it demands the necessity of large productions in place of much care, of quantity instead of excellence. Our correspondent clearly does not legitimately come within the category of "Cheap Jacks" with no feeling for their art beyond the returns it brings; and he must agree with us

in deprecating the race for cheapness which has tended to reduce, in many instances, a remunerative, if not a lucrative profession into one yielding a bare living. This is a state of things which does not conduce to efforts after high excellence.—Eu.]

CARBONATE OF AMMONIA IN THE FIXING BATH.

SIR,—As you invite remarks on the use of carbonate of ammonia in fixing solution of hypo. of soda, perhaps a short statement of my own experience may not be out of place. I have used it constantly since Mr. Spiller's formula appeared in the *PHOTOGRAPHIC NEWS YEAR-BOOK*, 1867. My formula is a little modified. The proportion of hypo to water is 16 per cent., and I add 4 per cent. carb. ammonia; filtering when dissolution is complete. It strikes me that the yellow spots complained of by your correspondent arose from omitting to filter. Last summer, in the studio of a friend, I recommended the use of ammonia so strongly that he agreed to try it. Hypo., carb. ammonia, and water, in the proportions I have named, were thrown into a porcelain fixing dish, and, when all was dissolved, the prints, after washing, were plunged into the fixing solution. In a few minutes they exhibited a profusion of small, white specks, about the size of the head of a pin. On examining the solution we found a number of minute grains of carb. of ammonia at the bottom; for unless very finely powdered before using, this salt dissolves much more slowly in water than hypo. Filtering would have removed the cause of those spots.

My experience goes to show that unless prints are of a deep tone to begin with, and have been their full time in the acetate of soda and gold bath, they are a good deal punished in fixing. In many instances, however, I have found that the sepia tone sometimes induced in fixing is entirely changed to a good purple-black, when the prints are washed, and finally dried.

Before using ammonia, I had often to experience the peculiar sulphur odour of the hypo solution when the prints were immersed in it. Since adopting ammonia it has never occurred to me. I never use the same solution twice. It may be fancy, but I think I see a more delicate bloom in the prints fixed by Mr. Spiller's method. It is too early yet to speak of the effects of it as a preservative of the print. I enclose one or two samples of prints fixed as I have described.—And I have the honour to be, sir, your obedient servant,

J. STOUTHERT.

Bruges, Rue Flamande 9, January 25th, 1868.

[The prints enclosed by our correspondent are extremely clean, bright, and pure in colour.—Eu.]

PERSISTENCY OF PHOTOGRAPHIC IMAGES ON GLASS.

SIR,—I have just experienced a singular proof of the tenacity with which a photographic image—or, rather, its ghost—may, as it were, haunt a glass plate, even under circumstances, to all seeming, quite incompatible with a visitation from such an apparition.

Six weeks ago I took two whole-plate copies from an engraving, intensifying one negative with the ferridyanide of uranium and gold intensifier, and the other with bichloride and gold, as recommended by Mr. Winter. Intending only to keep one of these negatives, I coated both with dilute gum in lieu of varnishing, and, after printing an impression from each, condemned that treated with bichloride of mercury as in all respects inferior to its double.

After removing the film from the discarded negative with hot water, I cleaned the plate as usual with tripoli in methylated spirit, and consigned it to the box. Last week I took a copy of another picture on that identical piece of glass. It was, to all appearance, as chemically clean and fit

for use as could possibly be desired. In consequence of being compelled to use a small stop, and the rapid deterioration of light arising from the lateness of the hour, I found great difficulty in development. When at last a picture slowly began to appear, you may fancy my surprise, sir, at observing that it included the most salient features of the old subject, as well as of the new. Thus the figures of some boys sliding in the background, and a basket of fruit in the foreground of the first, as well as the heads of a mother and infant, which formed the most striking feature of the second image, were most curiously and grotesquely intermingled, the handle of the aforesaid basket resting exactly on the centre of the child's forehead. I ought to mention that the first picture occupied the plate longitudinally, and the last breadthways. I should be glad to learn whether you, sir, or any of your readers, have experienced a similar effect under corresponding circumstances.—Your obedient servant,

H. J. C. ANDREWS.

Central Hill, Lower Norwood, January 28th, 1868.

[We have occasionally met with similar results.—Ed.]

Talk in the Studio.

THE LATE M. CLAUDET.—We are requested by Mr. Henry Claudet to state that a rumour to the effect that his late father was about to retire from the Photographic Society is incorrect, and manifestly based on some misconception. Up to the last he manifested a lively interest in the Society, and never to any of his friends or to his son, who was constantly in his company, intimated the slightest intention to withdraw from the Society, but, on the contrary, made repeated allusions to matters based on his intended continued connection with it. As the report that his father was about to retire from the Society on account of any personal dissatisfaction implies that a feeling of pique dictated his action, Mr. Henry Claudet asks us to deny a report which does injustice to his father's memory. A "Member of the Council," writing on the same subject, states that he spent an hour or two in the Conduit Street Exhibition, when he expressed the greatest satisfaction that the Society had secured such a successful exhibition. It is not necessary to insert our correspondent's letter, as Mr. H. Claudet's statement will correct the misconception.

PHOTOGRAPHS OF HISTORICAL DOCUMENTS.—The Corporate authorities of Exeter have resolved to reproduce a valuable collection of old and interesting memoranda, deeds, charters, and other documents now in their possession, and which have lately been brought into the light. It is proposed to photograph, photo-lithograph, and otherwise copy these very interesting records for the benefit of archaeologists, &c., &c.

AN AMERICAN ESTIMATE OF M. SALOMON'S PORTRAITS.—A letter from Mr. Pollock, an American photographer, states that examples of M. Salomon's portraits have caused as much excitement in photographic circles in the United States as in this country. Writing in our Philadelphia contemporary, he also says:—"We recently had the pleasure of a 'sitting' with M. Adam-Salomon, deservedly acknowledged by unprejudiced judges as the best portrait photographer in the world; and after carefully inspecting the arrangement of his studio, witnessing the manipulation, examining negatives and prints, all under circumstances most favourable for forming correct judgment, we are happy to add our testimony as to the simplicity of the means employed in producing wonderful results. So wonderful, indeed, are these portraits, that a large amount of jealousy, incredulity, unbelief, and prejudice exists regarding the manner of their production, giving currency to stories which have gained a wide circulation, to the effect that both negatives and prints are retouched from one end to the other—built up, in fact, with little foundation; and it is stated, as an instance of the degree to which this retouching is carried, that a picture-dealer, to whom a print had been sent to frame, accidentally allowed a drop of water to fall upon it, in endeavouring to remove which he washed the picture almost entirely out. Excellent photographers hold the same opinions, and suppose the prints carefully worked up, so great is the degree of their excellence and superiority to anything hitherto attained. In truth, however,

such is the perfection of the work, it has been remarked that one might as well gild refined gold, or paint the pure lily, in expectation of improving them, as attempt to add aught to the beauty or finish of these pictures by retouching." It should be remembered that Mr. Pollock here speaks of his own portraits, the negative of which, as well as the prints, he has in his possession.

ANTIDOTE FOR EXTERNAL POISONING BY CYANIDE OF POTASSIUM.—This substance is extensively used in electroplating and other arts, where its external poisoning effects produce many painful and troublesome ulcers on the hands of the workmen. The foreman of the gilding department of the American Watch Works writes to the *Boston Journal of Chemistry* that experience has taught him the most effectual remedy that can be employed in such cases, which is the protosulphate of iron in fine powder, rubbed up with raw linseed oil.—*Scientific American*.

PHOTOGRAPHY AND PARKESINE.—Parkesine, originally described in the pages of the *News*, is now being introduced in commerce as a substitute for ivory; and, as photographing on ivory can be readily done, and elegant results obtained, it may possibly be found advantageous to try its effects on the new material, which will be extensively used for many articles of domestic and ornamental use in lieu of the scarce and costly tusk of the elephant.

To Correspondents.

W. J. A. G.—Black is very dismal and uncomfortable-looking for any portion of the interior of a studio. A dark warm grey, a chocolate brown, a port wine colour, a dark crimson or maroon, or an olive green, will all be sufficiently non-actinic in their reflections, and much more pleasant to look at. 2. There is no patent for Mrs. Cameron's process. The black colour is easily obtained by deep printing and toning. The reason they look unlike photographs is two-fold: first, they do not possess, but absolutely ignore, the sharpness and detail which is the especial characteristic of photography, and in which it excels other modes of delineation; and, second, because there is really a large amount of artistic feeling displayed in the selection and management of each subject. As a rule, a free and artistic style of treatment, a lack of definition, and prevalence of deep shadow, characterize all her pictures. 3. A rising front does not give you the same advantages as a swing back. By means of a rising front you can regulate the amount of foreground, sky, &c., to be included in your picture; by a swing-back you can do this to some extent also; but its especial purpose is, when it is necessary, to tilt the camera to secure the roof in an interior, or a spire or tower in an exterior view of a building, to enable you to keep the sensitive plate parallel with the subject depicted, and so prevent the effect of converging perpendicular lines. 4. For general work, No. 3; for architecture, No. 1 is best. 5. The quality of the tone of a print depends very much upon the quality of the negative; but it is chiefly from the amount of reduction which the negative permits in the shadows without over-printing the lights. It is quite possible to get brown tones with the acetate bath, and a very short immersion is sufficient to secure it. Our choice of a toning bath much depends on the kind of results we desire, some tones suiting one subject, some another. For a rich, warm, purple brown nothing is better than the acetate bath; for black tones, the lime bath. We very frequently improvise a bath if we require to use it at once, and have none ready, by adding a little chalk to a concentrated solution of chloride of gold, diluting with hot water, and using when cool. 6. No. 1 undoubtedly.

A STRANGER.—There is no association or benefit society composed of operators in London or elsewhere, that we know of.

ARGENT.—In producing a transparency by the process we described, the negative is placed in the outer groove of the copying-box, as indicated at C, on p. 73 of our *YEAR-BOOK*, the lens being in the centre and the ground glass at the opposite end. If convenient, it is better to work in the open air, or with the end of the copying-box containing the negative placed out of a window, simply because more light is secured.

H. BERTON.—The colour test of alkaloids is an exceedingly fallacious means of detecting poisons, and, if relied upon, will frequently lead to error. For instance, iodic acid and starch form the colour test for morphia; and Orfila mentions a case in which the viscera of a healthy calf gave, with the test, exactly the same reaction in colour as the viscera of one which had been poisoned with morphia. This led to the discovery that lithic acid or the lithate of ammonia (constituents of healthy urine) gave the same colour with morphia as the recognized test, iodic acid. Another eminent French authority, writing on the subject, remarks that nothing is so deceitful as a reliance on colour tests.

R. B.—A thick solution of india-rubber in benzole, from 20 to 30 grains to the ounce, is the best thing for mounting photographs in an album, as then all risk of cockling is avoided. 2. You can procure iodized negative collodion of any photographic dealer. 3. Float on the salting solution about three minutes, and on the silver solution three minutes. The question whether acetic acid is to be added to the gallic acid depends for its answer on whether it is present, and in what proportion, in the silver bath. Painting a negative at the back to prevent "blurring" is done, of course, after the plate is prepared. A piece of red blotting-paper, moistened and pressed to the back of the plate, answers well.

B. B.—The address of Messrs. Foster, Auctioneers of Works of Art, is 54, Pall Mall. The address of Messrs. Christie and Co. is King Street, St. James' Square. We are glad to hear of your continued success with the modified collodio-albumen process. Thanks for your kind remarks about the *YEAR-BOOK*.

A PROVINCIAL PHOTOGRAPHER.—Judging from the print you forward, the negative is forged, probably by diffused light having reached the plate. The lights may be dense, but we should say that there is considerable deposit on the shadows; hence the want of depth in the shadows. We can only tell certainly on seeing the negative.

MRS. H. WEST.—The bleached or white bees'-wax is used for waxing photographs; paraffine is equally good, or better for the purpose. 2. The effect of adding cyanide of potassium to a solution of nitrate of silver is to cause a precipitate of cyanide of silver, which, when filtered out, will not cause further injury. Neutralize the nitric acid in your printing bath with ammonia, and try again. 3. The price of Mr. Edge's card pictures is 1s. 6d. each. A letter addressed Preston will find him.

YOUNG.—The light entering above A.B. in your diagram, at an angle of 45 degrees, would not reach the sitter; but you forget that all the light does not enter at an angle of 45 degrees, but a great many angles besides, and therefore some of it will reach the sitter. A very simple plan will enable you to ascertain how much light reaches the head of the sitter. Place yourself in that position, and cast your eyes around: from every point at which you can see the sky direct light will reach the sitter. All glass through which you cannot see the sky may with advantage be covered or obscured. 2. All light which does not reach the sitter is mischievous. 3. In a lofty room it is often advisable to have curtains which can be arranged near the head of the sitter for occasional use. Blue calico is a good material. 4. Portrait lenses rarely cover so evenly or illuminate so perfectly to the edges as view lenses; and in order to get all parts defined, very small stops must be used: nothing is gained in using them for ordinary landscape work, whilst something is lost. 5. About equal.

ALEX. AYTON.—Thanks for the excellent examples of card portraiture. We shall have pleasure in learning the result of your contemplated modification. We are glad to learn that your visit to M. Salomon was so pleasant and so satisfactory.

ENGINEER.—It seems probable that what you call fog in the transparencies produced by the method in question is really increased action of light, as it often happens that a thick film is more sensitive than a thin one. In some cases a little dilution of the collodion may be desirable. A good iodizer for the purpose will consist of two grains each of iodide of ammonium and iodide of cadmium, and one grain of bromide of cadmium.

X. L.—We do not know in whose possession the original painting of "Belshazzar's Feast," by Martin, now is. There is an engraving of it published, but we do not know of any photographic copies to the engraving.

A YOUNG BEGINNER.—So long as you take care to have your yellow light in your dark room thoroughly non-actinic, there is no danger in having a sufficient amount of it to make working easy and pleasant. It is a bad thing to have too little, as you cannot then properly see what you are doing. In such a room as you describe, a window three feet by three feet will probably answer. We are glad to learn that you are well pleased with the paper.

CHEMIST.—It appears to us that the lenses you have in your possession ought to answer well for the purposes you mention. What difficulty have you in using them? No. 3 is a capital lens, but not sufficiently long in focus for standing card pictures.

J. A. REED.—When the ternu parti is used, the formulae may be made up in grains, scruples, drachms, or ounces. Thus, if you make up the formula you mention in scruples, you will have 1 scruple of pyro and 1 scruple of citric acid in about 13 ounces of water, or something like $1\frac{1}{2}$ grains of each to an ounce. A 3 per cent. silver solution is a solution containing 3 grains of silver in 100 minims of water, or a fraction under 15 grains to the ounce of water. 2. It is the collodion containing nitrate of silver which has turned red. It may not necessarily be spoiled: try it. In any case, the collodion containing chloride is good still.

We are again compelled to leave over much interesting matter, owing to the pressure on our space; and many Correspondents also stand over until our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 402. — February 7, 1868.

CONTENTS.

	PAGE		PAGE
The Elimination of Silver from the Whites of Albuminized Prints.....	61	Vitrified India-rubber Sheet	66
The Practice of Silver Printing.....	62	Pictorial Effect in Photography. By H. P. Robinson.....	67
Visits to Noteworthy Studios.....	62	The Magic Lantern and Photography. By James Martin.....	69
Critical Notices.....	64	Albumen Opalotypes.....	69
Echoes of the Month. By an Old Photographer.....	64	Proceedings of Societies—Liverpool Amateur Photographic As-	
The Action of Ozone upon the Latent Photographic Image.....	65	sociation—Oldham Photographic Society	69
Hyposulphite of Ammonia and the Mixed Toning and Fixing Bath. By Nelson K. Cherrill.....	66	Correspondence—Double Printing: Combination Negatives.....	71
		Talk in the Studio	71
		To Correspondents.....	71

THE ELIMINATION OF SILVER FROM THE WHITES OF ALBUMINIZED PRINTS.

ALTHOUGH it may be impossible to secure the absolute stability of pictures formed of a metal like silver in an extremely minute state of subdivision, covered with an attenuated layer of gold, every suggestion which tends to increase the permanence of such prints must be regarded as a boon to photographers generally.

Besides the sources of instability arising from carelessness in the process of fixing and washing, albuminized prints are, even when produced with the utmost care and skill, subject to two dangers: in the first place, the minute particles of silver forming the image are acted upon by sulphur and its compounds, which are always more or less present in the atmosphere. This is, however, a comparatively light matter, inasmuch as the colour of sulphide of silver, being dark, may modify the colour of the dark parts of the picture, but can scarcely obliterate or seriously aid in spoiling the picture. But the chief defect observable in a fading print is the loss of purity in the whites, which assume a yellow degraded tint, which robs the print of all beauty. If the print were perfectly fixed, no trace of silver should be left in the white paper, and it should not, consequently, be subject to any change. The insoluble silver compound formed in the albumen, which hyposulphite of soda fails to remove, is the cause of this most serious defect in the print, and hence the vital importance of all experiments tending to its removal.

The recent experiments of Mr. Spiller have shown that the hyposulphite of ammonia is much more perfect in its solvent action on this silver compound than the soda salt hitherto used. Unfortunately, there are difficulties in the way of introducing the ammonia salt into the market, of which the chief is the fact that it is so highly deliquescent that it would be difficult to keep in stock, to weigh out, and to deal with generally. How far these defects might be removed by modes of manufacture, should a general demand arise for the salt, remains to be determined. Before a demand can be created, the claims of the salt as a fixing agent must receive more extended examination, and its advantages be proved by further experience.

Mr. Cherrill's article on another page describes an interesting experiment, and offers a most important suggestion, by the adoption of which the advantages of hyposulphite of ammonia may be tested, with very little trouble and expense, by photographers generally. Mr. Cherrill has, by adding sulphate of ammonia to the bath of hyposulphite of soda, converted, by a process of double decomposition, a portion of the latter salt into hyposulphite of ammonia. The test applied to the prints so treated furnished striking evidence of the superior fixing powers of the ammonia salt. Tested with sulphide of ammonium, the whites of the prints give the slightest possible evidence of the presence of silver, a

very faint discolouration being perceptible, whilst the whites of an ordinarily fixed print, treated with the same sulphide solution, show a very definitely marked brown stain. Another print, in which a portion of the paper has been carefully preserved from any action of light by a perfectly opaque mask, shows in the whites no trace of silver whatever, after immersion for a quarter of an hour in a solution of sulphide of ammonium, which had altogether changed the colour of all portions of the print containing silver.

Mr. Cherrill endeavours in his experiment to combine two distinct advantages. Besides securing more perfect fixation and the removal of silver from the whites, he aims to obtain the oft-coveted simplicity, certainty, and rich colour obtained in the old toning-bath of hypo and gold, with the immunity from mealiness, great reduction, &c., which attended it. Theoretically we see no reason why such a toning and fixing bath, when properly prepared, should fail to yield prints of permanency equal to those produced by the method at present in use. For those who are disposed to repeat Mr. Cherrill's experiments we have one or two suggestions to make.

In the formula employed by Mr. Cherrill, two drachms of sulphate of ammonia are added to the solution containing three ounces of hyposulphite of soda, by which nearly one-fourth of the latter salt will be converted into hyposulphite of ammonia. We would counsel going a little further, and, instead of two drachms of sulphate of ammonia, use an ounce of this salt, which will convert nearly the whole of the three ounces of the soda salt into the hyposulphite of ammonia, and the full benefit of its solvent powers may thus be secured. The sulphate of soda which is also formed by the double decomposition will, of course, remain in the solution inert, and need not be regarded.

In adding gold to the fixing bath, it should be remembered that as all crystallized samples of the chloride contain a little free acid, a slight decomposition will ensue, in which sulphur will be liberated. To avoid this, we recommend that before adding the chloride of gold to the hypo, it should be dissolved in water, and five grains of carbonate of soda added to each grain of chloride of gold. Any slight excess of the soda salt, when introduced into the fixing bath, will cause the formation of a little carbonate of soda, the presence of which will be beneficial rather than injurious. A toning and fixing bath so formed will consist of a strong solution of hyposulphite of ammonia, hyposulphite of gold, a little hyposulphite of soda, and a little carbonate of ammonia. There is no reason why, in such a bath, perfect toning and fixation might not proceed at the same time. But there is this important caution to be observed: such a bath may continue its toning property long after its fixing powers are exhausted. If, therefore, it be used for some time, the print should be immersed in a second fresh bath of hyposulphite of ammonia, and soda, made as

described, but without the addition of gold. Further, it should be remembered that the immersion of the unwashed print most undoubtedly produces some degree of sulphur toning, for many years the *bete noir* of photographers. We know that some sulphur-toned prints have remained for many years without signs of change; but, until the conditions of permanent sulphur toning are fixed, we commend our readers to take the ordinary simple precautions whereby it may be avoided. This may be done, as we have shown, without giving up the combined toning and fixing bath. The subject is one worthy of the attention of experimentalists.

THE PRACTICE OF SILVER PRINTING.

THERE are few photographic processes which have been brought to greater perfection in practice, so far as regards the production of immediate results—we put the question of final stability aside for the present—than silver printing on albuminized paper. Yet, from the correspondence which reaches us from time to time, we are satisfied that, notwithstanding all that has been written on the subject, much misconception—or, perhaps, rather, total lack of any idea—prevails as to the *rationale* of the process, and consequently at times much uncertainty in producing results. The production of good plain paper prints is still less understood, and consequently, notwithstanding the beauty of plain paper for large portraits, it has fallen of late entirely into disuse. In short, there are many points on the subject of silver printing, toning, and fixing upon which valuable systematic instruction may with advantage be imparted.

"It is always pleasant," Montaigne remarks, "to read things that are written by those who have experienced how they ought to be carried on." Cordially endorsing this dictum, we have arranged with one of our esteemed contributors who has devoted many years almost exclusively to silver printing, and who at different times has written much on the subject in desultory articles at different times, now to give a concise and systematic series of articles on the subject. Mr. Bovey, known to our readers as "The Photographers' Assistant," will accordingly commence a brief series of articles in which he will restate the whole process of silver printing, with its *rationale*, in which he will place before our readers a method which he finds unailing in simplicity, certainty, economy, and excellence of results. On the latter point we can speak in high terms, and with much confidence. Those of our readers especially interested in the series will do wisely to ask questions, or state difficulties, as the course proceeds, so that all points requiring elucidating may receive the fullest attention. The series will commence in our next.

VISITS TO NOTEWORTHY STUDIOS.

M. ADAM-SALOMON'S STUDIO—THIRD VISIT.

IN making a third visit to M. Salomon's studio, we shall bring before our readers a few details gleaned in conversation with him. We find him very accessible, and courteously communicative without reserve or any pretence of mystery. He is a gentleman apparently about fifty years of age; frank, earnest, and impulsive in manner; keenly sensitive and impressive; apt and free in conversation, with a great fund of humour and ready repartee. He appears to make no secret whatever of any part of his operations, nor does he seem to think it necessary to do so. Conscious, apparently, of capacity and culture as an artist, he treats each portrait as a work of art, and aims, as a matter of course, to secure in each the best pictorial effect compatible with the faithful rendering of character. He is manifestly an enthusiastic admirer of photography, appreciating with keen delight any peculiar beauty it renders perfectly; and whilst putting forth no especial claims for his portraits, neither declaring them touched nor untouched, it manifestly amuses him that anyone should accredit to retouching the peculiar

beauties of his pictures, or assume that the pencil of the artist could surpass the pencil of nature; and he does not hesitate to challenge the closest scrutiny and comparison of negatives and prints in various stages.

"But what is M. Salomon's practice as to touching?" we have been asked by one who has read our oft-repeated statements that some of his prints are untouched, some slightly touched, and some considerably touched. We can simply answer, as we have done before, that each picture is treated in accordance with its requirements, and the more perfect the photograph, the less retouching it requires or receives. But few photographs, especially of large size, are pictorially fit for issue without undergoing a process which the late Mr. Claudet used happily to phrase as "correction." This involved no working up in the ordinary sense of the term; it involved, however, not only the stopping out of pinholes, &c., but the strengthening of the iris of a blue eye which was almost burnt out by the light; the taking down of staring lights on a polished boot or similar surfaces, and the removal of any glaring defects which were in violation of natural or artistic truth. This "correction" is, we apprehend, applied as a simple duty and artistic matter-of-course to the majority of the portraits. Take an example of considerable touching in this way. The portrait of the young lady whose sitting we described in our last, although an excellent photograph as well as a charming picture, nevertheless required "correction." The white lace, to which we before referred as giving a "spottiness" destructive of pictorial effect, we found, in the finished print, was toned down with the pencil, and the obtrusive spotty lights it caused are sobered into harmony. A blue ribbon which tied the hair, and by its position caught the strongest light, and so became in the negative a mere white patch, is in the print touched to a quite delicate tint, which does not disturb the repose of the picture. The eyebrow, which in nature was very light in colour, and not very strongly marked, is scarcely indicated in the photograph; this, therefore, is strengthened. The gradations in the flesh are slightly blended by very delicate touches. No part of the picture is covered over and hid as in "worked-up" pictures; but various parts are ameliorated by the treatment which the picture has undergone, and without which it would have been imperfect as a work of art. And whilst nothing is added by this treatment to the admirable pose, the fine composition, the richness and solidity, yet it is, on the one hand, freed from offensive staring lights which marred the general effect, and, on the other, it has received some details belonging to the model, although omitted by photography, which add to natural and pictorial truth.

Conscious as we are that it is to artistic skill rather than to the materials used, we feel very diffident in asking questions as to processes and apparatus, but all we ask are frankly answered. The collodion used is simply bromo-iodized collodion, made by M. Salomon himself, as almost every photographer in Paris makes his own collodion. There is nothing peculiar in the silver bath, we are told: it is an ordinary nitrate bath, slightly acid. An iron solution is, as we have said, used both for development and intensifying, and a cyanide of potassium for fixing. The advantages of retouching the negative are not made available; but in many instances, where the face is very soft, a little pink colouring matter is placed at the back of the plate so as to slightly retard the printing in that part, and give a little more vigour to the lights.

A fifteen per cent. printing-bath—that is, a little over a 70-grain silver solution—is used. The albuminized paper is generally a commercial sample, although it is sometimes prepared in the establishment. The ordinary acetate toning-bath is used. Beyond the careful use of these things, there is no other aid to the perfect printing which has struck many observers. We examined prints in the washing-trough, which strike us, as much as the finished prints, with extreme purity of the whites, and suggest to us the extreme care which is evidently taken to keep the paper from the

light, a thing sadly neglected in ordinary printing. The washing-trough is arranged so that each print shall hang vertically in the water, so as to secure practically a continued drawing process during washing. The prints, after mounting, rolling, and "correcting," when necessary, are treated with wax, and then at once placed under glass. Each portrait is treated as a work of art which it is worth preserving.

In a conversation on the lens used, we learn that the old Hermagis was a careful selection from six of the same make, tried at the time. First, the whole were tried on one object, and the two giving the best result selected. These were then tried together and the best selected, for testing again with each other; and, to adopt the simile of M. Salomon, all the lenses, like horses on a race-course, having started fair, one after another dropped out of the running, until one alone was found much superior to all the rest, and this one was retained. The lens is, undoubtedly, capitally suited to the class of work done; but M. Salomon craves for something better, especially for more depth of focus, and intimates that he had recently tried one of the lenses celebrated for that quality, of an English maker. He found it in a single trial decidedly more rapid than the French lens, and anticipated good results when he had time to test it more fully.

Before leaving M. Salomon's studio, we may briefly refer again to the pictures produced there, and to the singular excitement they have caused amongst all interested in photography. As we have before stated, M. Salomon confines himself to working on one size of plate, which is 27 centimetres by 21 centimetres, or $10\frac{1}{2}$ inches by $8\frac{1}{4}$ inches. The proportion of the sitter included on this plate is, as a rule, about three-quarters of the figure, or a trifle more; in one or two instances only we have seen full-lengths, and in no case a large head and bust, nor, in any case, vignettes. The size of the head, in different examples, varies from an inch and a quarter in length to two inches. The prevalent characteristic of the pictures is massive grandeur, at least seven-eighths of the picture, as a rule, consisting of shadow or dark mezzotint, in which, however, there is no blackness, but a rich depth and transparency rarely seen in photographs. The amount of pure white in each picture is exceedingly small; and we do not find it occurring in any instance covering a space larger than a peppercorn, without gradation. Even in white linen, such as the cuff or collar of a shirt, we find detail and gradation, whilst in no instance do we find a fault, too common in many photographs, that the broad lights of flesh, such as a forehead or back of the hand, is represented by bald patches of white paper, undistinguishable from the tint of the linen. Many of the old painters were in the habit of introducing a little white in a painted portrait as a test of the purity and truth of their colour in flesh. M. Salomon is evidently fond of the same practice as a test of the truth of the texture and tint of his flesh in monochrome, and we almost invariably find a little touch of pure white in a linen or lace cuff next the hand, or in a collar next the face, giving great value to the tender gradations and modelling of the flesh. The breadth of shadow which prevails in his pictures is obtained by various means when it does not happen to exist in the costume of his sitter. Lace and velvet draperies of various kinds are at hand, and frequently used as adjuncts to the ordinary apparel of the sitters; curtains, table-cloth, column, a dark background—almost invariably placed so as to yield in itself light and shade, and hence the effect of relief, space, and atmosphere—are all made subservient to the characteristic pictorial effect. Although so little white is found in the pictures, they are generally distinguished by great luminousness and brilliancy, every shadow being rendered transparent by low lights in proper subordination. This is assisted by the rich warmth of tone which, with singular uniformity, prevails in the pictures, no cold or slaty effect being seen in any of the examples. Great variety of effect in the pose and arrangement prevails; but in all cases there is definite

intention manifest, and certain carefully considered plans of composition, and in all cases a perfect balance, both of lines and masses, is preserved. A standing position is evidently in favour with M. Salomon, and a profile, or five-eighths view of the face, is often made very effective in his hands.

A careful analysis of many of his pictures would be very instructive: we mean a pictorial analysis or examination of the plan of composition, not an analysis of the physical materials of which the picture is formed; as it is undoubtedly to the art excellence which the pictures owe their superiority. Of the fact of this superiority no doubt can exist. It is proclaimed by the large demand for them at high prices. Some time ago it was stated that M. Salomon had produced over fifteen thousand negatives; and as each negative represents four pounds sterling, and every duplicate print one pound, it is manifest that a large public appreciation of the superiority of the prints must have prevailed. It is not less proclaimed by the eager interest with which varied theories have been put forward to account for the superiority, and by the envy and jealousy which it has excited. "Dodges" of various kinds have been the common explanation; secret modes of manipulation; the use of a peculiarly coloured collodion; working on the negative; a secret printing process; masking and sunning down; and, above all, elaborate retouching, or working upon each print, and producing a monochrome painting instead of a photograph. The eagerness with which many have endeavoured to prove that photography was incapable of producing the results has been little creditable to their faith in their own art; and the bitterness with which others have endeavoured to show that whatever photography could do, these, at least, did not owe their superiority to photographic excellence, would have been amusing if it had not had something more of sadness in its suggestion. These are they whose

"Low desire
Not to feel lowest makes them level all:
Yea, they would pare the mountain to the plain,
To make an equal baseness."

And they who,

"If they find
Some stain or blemish in a name of note,
In fate themselves with some insane delight."

It seems to be overlooked by many that all the secrets and dodges in the world would not account for the artistic qualities in which the superiority lies; that retouching would not account for the greater part of the characteristic excellence of these pictures, which consists chiefly in the pictorial composition, and, so far as it is of a technical kind, is found rather in the rich masses of transparent shadow of which the bulk of each picture consists, than in any other especially photographic peculiarity.

We have insisted, from time to time, upon the fact that it is to art qualities chiefly the superiority is due, because we believe it is true, and because we are very anxious to impress the importance of art culture upon photographers. We have insisted that this excellence was not due to dodges or secrets, because we were anxious that our readers should not be, to use a colloquialism, placed on a false scent, and so inevitably miss the chance of improvement. We have insisted, not that the pictures were in all cases untouched, but that it was not to retouching that they owed their peculiar effectiveness, because such an impression was mischievous and misleading.

It may be desirable, in conclusion, to correct another error which has been made in one or two quarters, namely, that likeness to the original is sacrificed to pictorial effect. In this matter we can only speak of the cases we know. Of half-a-dozen portraits of members of our own family and personal friends we possess, in each instance they are characteristic and pleasing; as perfect as likenesses as they are effective as pictures; eliciting, by common consent of all who see them, the acknowledgment that they are the most satisfactory likenesses which the originals have had taken.

We take leave of M. Salomon's studio, satisfied that the

pictures he has produced and exhibited cannot fail, notwithstanding the discussions and jealousies they have excited, to give an impulse to artistic portraiture, by showing that a much higher standard is possible than that usually attained. For our own part we have been at once gratified and instructed by our examination of his pictures, and by the repeated visits to his studio; and we have here pleasure in expressing our obligations to M. Salomon for the ready liberality with which he has placed every facility in our way for affording the fullest information to our readers, and for the kindly courtesy and pleasant welcome extended to ourselves personally on every occasion we have had the pleasure of seeing him.

Critical Notices.

THE PHOTOGRAPHER: A Manuscript Magazine.

THE last number of this revived amateur magazine, to which we referred some weeks ago, contains some examples of the comic lyrics occasionally sung at photographic festivals. The story of "Mr. William Baker, a Carte-de-Visite Taker," is told, for which we may, on another occasion, find space. We now quote a song which was prepared for the last South London Dinner, and sung amid much applause and laughter. As our readers will see, it relates a photographic episode in the life of a popular convivial monarch.

KING COLE TURNED PHOTOGRAPHER.

I.
Old King Cole was a merry old soul,
And a merry old soul was he;
But he gave up his pipe, and he gave up his glass,
To take up with photographicie.
For one summer's night he had a great fright,
And a very queer dream had he,
That one Jabez Hughes stuffed the PHOTOGRAPHIC NEWS
Into his cerebral cavity.
And he went raving mad, crying, "Oh! that I had
A taste for photographicie."

II.
Old King Cole was a merry old soul,
And a merry old soul was he;
"Oh, bother my pipe!" said he, "bother my glass!
And bring me my cameras three."
Each camera had a fine lens,
As fine as a lens could be;
'Twas made by a man who was named Voightlander and Company,
With a spherico-concave-convex curve,
And an aperture six foot three.

III.
'Twas worked by steam, though strange it may seem,
And lighted by electricie,
And sixpence a day kept the bath in full play,
While collodion was generated free.
It dipped its own plate, and posed those who sate,
All by rackwork machinerie;
And it washed and developed, and in passe par tout enveloped,
A marvel of photographicie.

IV.
Old King Cole was a merry old soul,
And a merry old soul was he;
"I want a carte-visite (my camera, where is it?)
Of my first Lord-in-Waiting," said he.
He put him on a chair, and he fixed him there,
As tight as if screwed by the knee;
But the focus was so strong, it dragged him along,
And suspended in mid air was he.
"Oh, there's none anywhere," says he, "can compare
With the wonders of photographicie."

V.
He next tried its power on a passing rain shower;
But so sharp was its efficacy,
That the big drops of wet through the thick lens would get,
And a small bit of thunder strained free.
A baby, one day, whom he tried to portray,
As plump as a baby could be,
Was found squeezed flat, and as black as your hat,
On the ground glass, d'ye see.
"Oh, there's none anywhere," says he, "can compare
With the wonders of photographicie."

VI.

If a landscape scene he tried to get in,
With the flocks roaming over the lea,
You could hear the sheep bleat when you looked on the plate,
And the cows lowed as plain as could be.
And, once, when his art he tried on a cart,
With a horse rather frisky to see,
He was done with such tact, that the horse kick'd in fact,
And from negative nearly got free.
"Oh, there's none anywhere," says he, "can compare
With the marvels of photographicie."

VII.

If a man and his wife, by chance had a s'rife,
And the instrument near them placed he,
You could hear naughty words 'twixt the lens and the boards,
And their thumps 'gainst the side most plainlie.
But the worst that befel was most wondrous to tell,
When a battle he tried to display,
For the gunpowder smoke his best Voightlander broke,
And blew the whole camera away.
"Oh, there's none anywhere," says he, "can compare
With explosions in photographicie."

VIII.

So Old King Cole, that merry old soul
(For a merry old soul was he),
Said he: "I've had quite enough of this troublesome stuff,
And I'll now give up photographicie;
I've blacked both my thumbs, and filled my albums,
And I've spent no end of monie;
For the rest of my life I'll give up toil and strife,
And stick to my fiddlers three;
Though there's none anywhere that I know can compare
With the marvels of photographicie."

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

THE LATE MR. THURSTON THOMPSON—APPOINTMENT OF PHOTOGRAPHER AT SOUTH KENSINGTON—FIRE PROOF ROOMS FOR NEGATIVES, ETC.—THE OLD TONING AND FIXING BATH—COLLODIO-CHLORIDE PROCESS—MR. McLACHLAN'S DISCOVERY—DISTILLED AND COMMON WATER—SEL CLEMENT—SALOMON'S PORTRAITS—SOCIETIES.

YET another of the foremost rank in photography has been numbered with the men that are gone. Mr. Thurston Thompson was little known, personally, to the public, being a modest and most unobtrusive gentleman; but he was one of the men of the highest culture in connection with our art, and of exceedingly fine taste; and few men could have been so thoroughly well qualified for the duties of Photographer to the Science and Art Department as he. His work in reproducing the valuable contents of the Museum at South Kensington must have been well nigh done, as upwards of ten thousand negatives, I understand, have already been secured in that department. As was not unnatural, there were several candidates anxious to fill the position made vacant by the death of Mr. Thompson, and I understand that another gentleman bearing the same name, but no relation, has received the appointment. Mr. Stephen Thompson, a photographer of much taste and skill, will henceforth undertake the foreign photographic work for the department; the work at home will be done, as it has been for some time past, by Messrs. Cundall and Fleming.

A disastrous fire in a photographic establishment is fortunately not of very common occurrence. That which recently took place in Mr. Claudet's studio, in Regent Street, however, suggests some startling reflections as to the importance of fire-proof rooms in photographic establishments. Upwards of twenty thousand negatives are stated to have been destroyed, much of the damage being caused, I am told, by water. This is a serious matter; for, in a certain sense, the negative may be said to be held in trust by the photographer for the benefit of the public. The sitting having been accomplished and the price paid, the public believe that henceforth they can go and have prints when they require. The ownership of the negatives is a point which has not yet been authoritatively determined.

Some affirm that the price paid at first covering the cost of the production of the negative, it is legitimately the property of the sitter, as a card plate belongs to the customer after he has paid the price for engraving it. But, be this as it may, it is left in the hands of the photographer under an impression that he can at any time command prints from it without paying the first cost of production again. Thus a quasi obligation is laid on the photographer, for the sake of the public, as well as himself, to preserve the negatives with extreme care. How far fire-proof rooms would preserve negatives amid the great heat of a burning building remains a question to be determined. There is another class of property to be considered under such circumstances. Whilst I was looking at the scene of Mr. Claudet's fire, I noticed a lady and gentleman enquiring after a family portrait, in the shape of an oil painting, which had been left to copy; and it, with many more such, had perished in the flames, an irreparable loss. These are the common risks of life, it may be said; all valuable things are liable to destruction. True; but just in proportion to the possibility of loss, and to its irreparable character, becomes the importance of safe-guards; and it appears to me that, from the importance of preserving these things, it may be worth a thought, in building large and important photographic establishments, as to whether a fire-proof room ought not be secured for the safe keeping of negatives and other important matters.

The question, "Do you think that we shall return to the old toning and fixing bath?" has been asked in my presence repeatedly lately. Almost all photographers speak with a certain degree of regretful affection of the old method. When it was abandoned it was in the firm hope of obtaining greater permanency; but photographers now-a-days are often tempted to ask, Has the greater permanency been secured? The question was boldly stated by Professor Towler in your columns recently, and it is one, I think, which will well repay discussion. For my own part I can simply say, at present, that I have prints in my possession toned and fixed considerably upwards of a dozen years ago, which are still free from signs of fading.

A print I have seen, by Obernetter's modification of your collodio-chloride process, is exceedingly fine, and one cannot but wonder that a process so capable of fine results is not more practised in this country, where it was first introduced. English photographers are singularly conservative. Albuminized paper is the recognized material for prints, and modified silver processes and carbon processes alike fail to dislodge it.

Mr. McLachlan's announcement is a startling one. Absolute certainty of the chemical conditions which will secure the highest success, absolute certainty of maintaining these conditions: what more in this direction can we possibly require? I must confess that it is a little hard on photographers to place each in the position of Tantalus for six months, with the cup just within, but still beyond, reach of his thirsty lips. Some I have heard disposed to regard the announcement as a practical joke, and others treat it as gasconade; but, after all, if Mr. McLachlan have discovered the actual nature of the change effected on the sensitive film by light, there can be little doubt that such a knowledge will very materially simplify the conditions of success. Mr. McLachlan states that he has discovered the change to be a chemical one: this determined, the causes which retard or facilitate or otherwise affect the chemical action may be easy to state. Altogether, I am disposed to hope that Mr. McLachlan's announcement bodes good to photographers.

The question raised by Mr. Cherrill as to the use of common water in place of distilled water is an interesting one; but it must be owned that his proposition is somewhat audacious. So much stress has always been laid on the use of distilled water in photography, that a proposition to throw it aside altogether seems to strike at the very basis of our photographic faith. There is a daring independence in the

notion which is very attractive, and as Mr. Cherrill is known to be an excellent photographer, it may be taken for granted that the idea has been both well considered and tried before it was committed to the public. For printing-baths, toning-baths, developing-solutions, &c., I have long used river water myself; but I must confess that I should hesitate at present to use it for my negative-bath, or for the first washing of dry plates. I am open to conviction, however, and I presume that we have not yet heard the *dernier mot* on the subject. The difficulty which strikes me most is the great variety in quality of what is termed "common water," which may mean almost anything, and contain almost any impurity without exciting suspicion, so long as the clearness and brightness of the water is not destroyed.

Has any of your readers tried the "Sel Clemeut, or Preservative Nitrate of Silver"? Something like eight years ago, I remember, a "photographic ink," to supersede nitrate of silver, was introduced in Paris, which turned out to be, on examination, nitrate of silver and nitrate of potash. The new salt is, I am informed, nitrate of silver and nitrate of magnesia. The compound will, I believe, be useful in printing; but whether economical or not is another question, which can only be fairly determined by trial.

The controversy on the subject of M. Salomon's prints still keeps cropping up afresh. Many photographers are quite satisfied as to the means of obtaining them; but they all abstain, with singular self-denial, from putting the means into practice, and producing similar pictures. An "analysis" of these pictures, published in a contemporary, and signed "Scrutator," was very amusing. If the statements made were true—namely, that on sponging a print, and removing the retouching, a poor, hard, black-and-white picture only was left—it is obvious that they required the guarantee of a responsible name, instead of a mere *nominis umbra*, and that, if the writer did not care to divulge his name, he should have sent the proofs of his statement, so as to secure the endorsement of the Editor. As the matter stands, the statement appears to me without any value whatever. An opinion or an argument may be as valuable when put forth anonymously as when guaranteed by a name; but a statement of alleged facts, especially if those facts impeach the good faith of another, is worse than worthless when put forth anonymously. If the statement be true it is of little weight, as no one will be so foolish as to draw general conclusions from such narrow and insufficient premises as the examination of a single picture, which, by the way, it is insinuated, was one of the prints (the lady with riding whip) exhibited by the Editor of this Journal at the late exhibition in Conduit Street, and he ought to be able to throw some light on the story.* There is one important idea in connection with this subject which should be borne in mind: as much of artistic culture consists in acquiring the power of seeing, it is manifest that the incapacity of producing such pictures as those in question is much dependent on the incapacity to perceive the real sources of their beauty; and although executive skill is necessary, as well as perceptive and conceptive power, to the artistic faculty, yet once a photographer has made himself master of the sources of superiority in these pictures, he will have progressed considerably in the direction of producing something like them.

At the Societies some interesting subjects have been discussed. The North London meeting, following on New Year's Day, consisted only of the Chairman, the reader of the paper, two reporters, and one member to form the audience. The discussion on the paper, which was by Mr. Dunmore, on art subjects from a photographic point of view, was therefore postponed. At the Parent Society, Mr. Spiller read one of those valuable papers, full of valuable information on the chemistry of photography, with which his name is generally associated. At the South

* Neither the lady with the riding whip nor any of the pictures we exhibited in Conduit Street have been out of our possession since, nor have they been subject of any such "analysis."—Ed.

London Society, Mr. Johnson read a capital paper on clouds in landscapes, and a very interesting discussion followed. At the Provincial Societies nothing very noteworthy has occurred.

THE ACTION OF OZONE UPON THE LATENT PHOTOGRAPHIC IMAGE.

Dr. PIERSON, in his correspondence with our Paris contemporary, mentions that Dr. Emerson Reynolds has just completed a series of experiments calculated to throw some additional light upon the nature of the latent photographic image, and aid in bringing to a termination the discussion which has been going on for several years in reference to this subject. Dr. Reynolds conceived the idea of studying the action of ozone upon the latent image—that is to say, upon the image before development—and he has communicated the results of his researches to the Dublin Chemical and Philosophical Club. He found that in submitting the latent image to the action of ozone the picture disappeared completely; not only could no image be developed, but it was possible to obtain a second image upon the same plate on replacing the latter in the camera.

The author remarked (and it seems to us with much truth) that this experiment utterly destroys the idea of a physical action, and completely refutes the arguments of those who pretend that the first influence of the luminous rays is to bring about a molecular change whence results the latent image, which is afterwards developed by means of chemical agency. According to Dr. Reynolds a chemical action is set up from the commencement, and the latent image is therefore not due to a physical change, but is purely the result of chemical decomposition.

This action of ozone upon sensitive plates, and its presence in greater or less quantities in the atmosphere, suggested to the author the idea that the many discussions which have lately taken place with reference to the time that dry plates will retain their sensitiveness may thus be explained; in fact, plates ought to exhibit a greater or less degree of sensitiveness, according to the amount of ozone existing in the atmosphere on the day of their exposure.

The ozone—or, rather, the oxygenized air—employed in these experiments, was obtained in two different manners, both descriptions furnishing identical results. The one kind was obtained by passing atmospheric air over phosphorus half covered with water, and the other by means of the silent electric discharge—that is to say, by attaching one of the platinum wires of the reservoir to the conductor of an electric machine, the handle of which was slowly turned, the other wire being put to earth.

VITRIFIED INDIA-RUBBER SHEET,

Applicable for the Transfer of Films, to Printing Transparent Positives, and to the Production of Carbon Photographs.

WE learn, from the statement of M. Ernest Lacan in the *Moniteur*, that M. Marion is about to introduce into commerce a new material calculated to render important services to the photographer. According to information borrowed from a pamphlet entitled *Notes Photographiques de 1868*, which is shortly to be published, this new material appears to hold an intermediate position between paper and glass, having the suppleness of the former combined with the transparency of the other, without possessing its fragility. The purposes to which such a material may be put, as a support for collodion, either as a basis upon which to pour the sensitive solution, or for transferring the film from a glass plate, are at once easily understood. It is very simple and easy to manipulate, and in many ways susceptible of advantageous employment in the studio, and more particularly when travelling.

M. Marion is sanguine that it will be possible to produce a photographic image upon the film itself, and in this case

nothing would be simpler than to supply it to operators in a sensitized condition.

The method of applying the sheets of vitrified india-rubber is as follows:—

A varnish of a special character is poured over a glass negative, varnished or not as the case may be, and the sheet of rubber placed thereon; when perfectly dry the plate is plunged into water, and in a very short time the film will abandon its previous support and adhere to the new one. Pictures transferred in this manner may be kept in a box or portfolio until required for printing, and will be found to yield the most excellent pictures, remarkable both for clearness and harmony of tone.

The carbon process will certainly find in this material an element specially calculated to simplify and vulgarize the method. In fact, the most simple mode of proceeding will be to use the rubber film as the basis of the coloured pigment composition, which is then exposed under a negative, the prepared side outwards. After developing the image in warm water it is mounted on cardboard, face downwards, so that the transparent film of rubber keeps the picture perfectly even, and likewise serves as a protection to it; or, M. Marion believes it will even be possible, after the picture has been mounted, to detach the india-rubber film, which may afterwards be used over again for the same purpose. In the mean time, however, he will confine himself to the manufacture and supply of ordinary transparent india-rubber sheets capable of employment in any way that the operator may judge most fit; and it is certain that in its present condition the material will be applicable to many purposes in the different branches of the art.

HYPOSULPHITE OF AMMONIA AND THE MIXED TONING AND FIXING BATH.

BY NELSON K. CHERRILL.

PERHAPS there is no subject of more universal interest among photographers than the improvements made from time to time in the various methods of printing. All photographers look for permanence in their work, and all hope to obtain it in some way or another. Some have tried, in many ingenious ways, to mend the old paths, and improve the silver printing which has been so long in vogue; while others have made for themselves new paths, and have sought for permanence in the known stability of carbon and its application to photography.

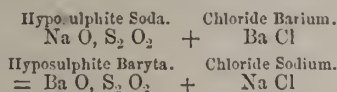
It is, I think, allowed on all hands that, for many purposes, silver printing is most important, and its improvement will always be a matter of great interest and utility. I have, for a long time past, been much in favour of carbon printing, as I have always said, for “one’s best work;” but to any one who has experimented much in carbon it is manifest that none but first-rate negatives must be used in carbon printing; and so, whilst it is often necessary to print from a negative not quite up to the proper standard for carbon, and whilst a cheaper form of printing than carbon is required, and also as long as, for a certain class of subjects, the peculiar richness and glaze of albumen paper is thought desirable, there can be no doubt but that silver printing will maintain a high position, even though some few men may desert it in favour of the more permanent and artistic carbon printing.

Whatever may be the feelings of the photographic public on the comparative merits of carbon and silver printing, there can now be no doubt as to the mind of the general public in the matter. “If,” say they, “carbon is permanent, give us carbon.” When photographers are in the position to say: “Our silver prints are as permanent as our carbon ones”—if ever they be in that position—of course it remains to be seen what the public will say respecting the comparative merits of carbon and silver printing. Now they know, by experience, that silver prints, as usually done, are anything but permanent.

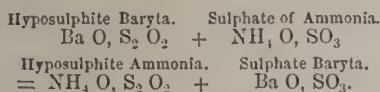
The two main causes of want of permanence are pretty well known: one is the imperfect action of the fixing bath, and the other is the imperfect washing of the prints after they are fixed. One of them is a chemical difficulty, and the other a mechanical one. It is of the chemical difficulty that I am about to speak.

Mr. Spiller, a gentleman to whom all photographers are indebted for his patient investigation of the subject of imperfect fixation, has told us of a plan by which, in his opinion, this chemical imperfection can be done away with. This discovery, if it be substantiated by further experiment, is one of very great importance, and one to which too much attention cannot be paid, because, if we can be rid of the chemical element of decay in our silver prints, I look upon the mechanical question of washing out the hypo as a matter of comparatively easy accomplishment. Mr. Spiller recommends the use of hyposulphite of ammonia to supplement the action of the hyposulphite of soda.

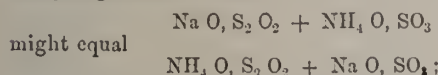
When I read Mr. Spiller's paper (read before the London Photographic Society), a thought struck me that possibly the same thing might be done in some other way. I do not know if I am right, but will explain. Mr. Spiller says: Add chloride of barium to hyposulphite of soda, and you will have formed hyposulphite of baryta; add hyposulphite of baryta to sulphate of ammonia, and you will have hyposulphite of ammonia. Now, it struck me, *why not* add hyposulphite of soda to sulphate of ammonia, and why should not these form, in some measure, the hyposulphite of ammonia. I will give it in symbols. Thus



And



Now, it appeared to me that perhaps, if hyposulphite of soda were added to sulphate of ammonia, much the same thing might occur. Thus



so that, by adding some sulphate of ammonia to the ordinary hypo bath, a certain proportion of hyposulphite of ammonia might be formed in the solution.

Some similar result, it struck me, might be obtained by adding the carbonate of ammonia to the fixing bath (as before recommended by Mr. Spiller), and then, perhaps, the advantage gained by so doing might result from the formation of a proportion of hyposulphite of ammonia. Be this as it may, I put my idea to the practical test, and send up by book post, with this paper, the results I obtained.

As it seems to be stated on authority that no gain in permanence *ought* to be obtained in separating the toning and fixing solutions, my experiments were directed to the addition of sulphate of ammonia to the bath, recommended by Professor Towler in the News a week before Mr. Spiller's paper.

After a careful consideration of the matter, I resolved to make the bath for toning and fixing as follows:—

Water	...	...	8 ounces
Hypo-sulphite soda	...	...	3 "
Sulphate ammonia	...	...	2 drachms
Acetate soda	...	...	1 drachm
Chloride of gold...	...	...	5 grains,

mixed in the manner recommended by Professor Towler. The prints were plunged in this solution straight from the printing-frame, without any previous washing. They toned beautifully, and it was manifest that, after a little practice,

any tone could be obtained with great ease. The reduction in tone was not so much as with the ordinary alkaline bath, but rather more than with sulphocyanide toning. After fixing, the prints were removed to a pan of water, and washed in the usual way. One of the prints had come to the surface of the fixing bath, and had consequently become spotted, owing to the unequal action of the solution. This spottiness subsequently served to show the comparative effect of the hydrosulphate of ammonia on those parts which had a shorter time in the fixing bath than usual. To test these prints as to their chance of permanency, I took a solution of hydrosulphate of ammonia in water, and treated them with it.

Of those I send in the separate parcel, the pantaseopic picture, with the brown stain in the middle, is one done about three years ago in the ordinary manner. It shows, as you see, no sign of fading or of yellowness in the sky; or, rather, it did not when I began to experiment with it. A few drops of the hydrosulphate solution, poured in the centre, showed at once the brown stain now seen there. At the same moment I poured on the sky of the other landscape enclosed—one done with the new bath—some of the same solution of hydrosulphate: you will see what a very slight effect it has had. The brown stain is not by any means so apparent in the one by the new bath. To show that the age of the former print had nothing to do with the formation of the stain, I also tried a much more recent silver print, also in very good condition, and with just the same effect; viz., the formation of a deep brown stain in the whites where the hydrosulphate solution touched it.

The very slight stain in the sky of the picture done in the new bath seems to me much more due to the discolouration of the silver present in the delicate tint of the sky than to any silver present in the whites; and this position is confirmed by the little portrait of a gentleman, in which part of the paper was marked by the black paper in the printing. In this case, though the hydrosulphate solution (of the same strength as before) was in contact with the print for nearly a quarter of an hour, yet it will be seen there is no yellowness or discolouration upon the white part of the picture, which remains almost, if not quite, as pure as it was before the application. The colour of the silver forming the picture has, however, suffered from the prolonged application of such a severe test.

I merely mention and exhibit these results that those who take an interest in them may form their own opinion of their merits, and may judge for themselves of their bearing on the question at issue—the perfect fixing of silver prints. The matter is one, as Mr. Spiller, and, indeed, as all experimenters justly observe, for “further investigation.”

I propose to continue my experiments, and, should they issue in any further successful result, shall be happy to send you a further communication on this subject. In the meantime, I shall look forward with much pleasure to seeing your opinion of these experiments expressed in the News.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER 2.

“This laborious investigation, I am aware, must appear superfluous to those who think everything is to be done by felicity, and the power of native genius.”—*Sir Joshua Reynolds.*

“Let me see, let me see, let me see!”—*Shakespeare.*

It is an old canon of art that every scene worth painting must have something of the sublime, the beautiful, or the picturesque. By its nature, photography can make no pretensions to represent the first, but beauty can be represented by its means, and picturesqueness has never had so perfect an interpreter. The most obvious way of meeting with

picturesque and beautiful subjects would be the possession of a knowledge of what is picturesque and beautiful, and this can only be attained by a careful study of the causes which produce these desirable qualities. He who studies the various effects and character of form, and light, and shade (to a photographer the addition of colour would only be complication), and examines and compares those characters and effects, and the manner in which they are combined and arranged, both in pictures and nature, will be better qualified to discover and enjoy scenery than he to whom this study has never appeared necessary, or who looks at nature alone without having acquired any just principles of selection. However much a man might love beautiful scenery, his love for it would be greatly enhanced if he looked at it with the eye of an artist, and knew *why* it was beautiful. A new world is opened to him who has learnt to distinguish and feel the effect of the gorgeous harmonies that nature presents in all her varied aspects.

Take an illustration of how much more an acute observer of nature must enjoy than the dull man who jogs on through the world with his eyes open but his mind blind. Can it be doubted that Shakespeare more infinitely enjoyed the amusement he derived from his study of character than common observers? Combinations of incidents and characters must have struck him much more forcibly, and must have afforded him keener enjoyment than they would those who had not the capacity of seeing and appreciating the humours of the times in which they lived. His works point out to us many scenes that would escape us in real life. So also the trained artist will discover and reveal beauties that others pass by without notice, in our walks abroad and in our every-day existence. How often does it happen that a photographer will take his camera and dozen dry plates to a district he has been recommended to visit because it contains so many picturesque objects and artistic bits, and has returned at night unsatisfied and gloomy, with "no game in his bag," declaring the place dull and uninteresting, without a single object worthy of his attention; again, another photographer, who, like Beatrice, "can see a church by daylight," but little else, will walk through the land photographing every object, so that it is an object, he meets with. But then what he means by an object is something very definite; it must be a castle, or abbey, a stone cross, or mansion—something you can "put a name to." It is of no consequence to this collector of negatives whether his subject has anything in it capable of artistic treatment, whether a few yards to the right or left would improve the effect, or whether a little more sky or a little more foreground would increase or diminish the apparent size of the subject he is about to secure; his only anxiety is that the house or castle he is photographing shall come in the middle of his plate, and that nothing shall come in the way of his getting a good map of its elevation. This is no fanciful picture I am sketching, but I have so many originals for it in my mind's eye that it can scarcely be called the portrait of an individual. Yet another photographer will scarcely care where he goes; he has learnt to select, and finds pictures everywhere. He does not do this by instinct or any inborn faculty; he has had to acquire his knowledge; he has learnt to know what he wants, and picks it up the moment it is before him. It must not be inferred, from what I have just said, that because art has to be learnt I consider it possible for all to learn alike. It is not possible for one in a thousand to attain a perfect knowledge of art; but it is certain that all, especially those whose instincts have turned them to a kindred study like photography, may learn sufficient to save them from making any very serious blunders in their works. All men have to learn. "Art," as Sir Joshua Reynolds has said, "is not a divine gift." The power of acquiring it perfectly undoubtedly is.

These observations may appear trite, but they are the keynote of all I have to say in future chapters. I wish to show that it is the photographer's business to *see*; to do which he must learn to see, that by seeing he may appreciate, and that the power of seeing may be, as it were, artificially

cultivated by the study of those rules and axioms which have guided the greatest painters, sculptors, and architects, in the production of their finest works.

But, before I proceed, I must warn my readers against a too close study of art to the exclusion of nature and the suppression of original thought. Whoever studies art alone will have a narrow, pedantic manner of considering all subjects, and of referring them to this or that style of composition, or this or that order of picture. This class of student looks at nature only through the medium of famous painters' pictures; a calm sunset is always a Claude; anything wild or confused is Turnerian (in his last period; it shows knowledge to speak of the "periods" of a master). "What a delicious Wilson or Ruysdael!" one will say as he looks at a waterfall; "Quite a Landseer!" another will exclaim at the sight of a sheep-dog or deerhound; and so on. Nature can only remind them of some class of picture. This is a perversion of study, and tends to degrade nature to the level of her imitators, instead of assisting to elevate her students to the level of the humble distance from her perfections to which it is possible to artists to attain. What I want here to impress is, that art should be a guide only to the study of nature, and not a set of fetters to confine the ideas or to depress the faculty of original interpretation in the artist, whether he be painter or photographer; and a knowledge of the technicalities of art will be found the best guide.

There is a tendency amongst young artists to despise rules, and to trust to instinct and a feeling for art; but it is not only well to do right, even if that were possible, by instinct alone, but it is also pleasant to *know* you are doing right; and, although it is not well to curb rising genius, a knowledge of principles which, from their universal adoption for ages, must be sound, must be an addition to the powers an artist, in whatever material, has to bring on his subject. Sir Joshua Reynolds, in his sixth discourse, has some excellent remarks on this subject, which are much more forcible than anything I could hope to say myself.

"It must of necessity be, that even works of genius, like every other effect, as they must have their cause, must likewise have their rules; it cannot be by chance that excellencies are produced with any constancy or any certainty, for this is not the nature of chance; but the rules by which men of extraordinary parts, and such as are called men of genius, work, are either such as they discover by their own peculiar observations, or of such a nice texture as not easily to admit being expressed in words, especially as artists are not very frequently skilful in that mode of communicating ideas. Unsubstantial, however, as these rules may seem, and difficult as it may be to convey them in writing, they are still seen and felt in the mind of the artist; and he works from them with as much certainty as if they were embodied, as I may say, upon paper. It is true these refined principles cannot be always made palpable, yet it does not follow but that the mind may be put in such a train that it shall perceive, by a kind of scientific sense, that propriety which words, particularly words of unpractised writers such as we are, can but very feebly suggest."

Having now pleaded, where no pleading should be necessary, that artistic knowledge is essential to the photographer, I shall aim, in succeeding chapters, to become more specifically practical, and endeavour to give my readers some ideas of those forms of lines, and of masses of light and shadow, that constitute composition in art. These forms, which produce balance, unity, and harmony, may often seem intangible, and the student may be tempted to ask—

"If shape it might be called, that shape had none
Distinguishable in number, joint or limb,
Or substance might be called that shadow seemed,
For each seemed either!"

But to the instructed eye each intangible line, and light, and shadow, plays its definite part in forming a perfect composition.

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 5.

WHEN the pupil has succeeded in obtaining a clear, firm, and true outline, the glass on which he has been working may be removed from off the copy. Before leaving this subject, it is as well to observe that, although the outline in the foreground objects may be moderately coarse, it ought to diminish in size as the planes of the picture recede, until, in the extreme distance, it is very fine, indeed; otherwise the aerial effect will be marred, and every object seem as if edged with a black ribbon. This effect is much increased by the great magnifying power of the lenses used in the lantern. Some artists, instead of lampblack, make their outlines of various tints approaching those of the objects to be painted, so that when they are finished they are not seen at all. Having all the colours to be used finely ground, the glass easel erected to a proper angle, with a piece of white paper underneath to reflect the light through the picture placed on, it will be requisite to form a sort of palette, or series of colours, on either a piece of glass about plate size, having a piece of white paper underneath it while in use, or a small earthenware palette, which can be bought of any artists' colourman for a few pence. This will suit the purpose better than anything else, as the real strength of the tints of colours can be easily seen on its white surface when setting your palette. It is best to always place the colours in the same rotation, beginning at the same place, so that you may know readily where to find the colour when wanted. It is usual to place the light and warm colours near the thumb, the darker and colder colours round the rim; therefore the gallsone will be placed next the thumb, then the madder carmine, and lastly the blues. Supposing some pleasing subject is chosen as an example to begin with, containing not too much complication of outline, but embracing as many of the usual features of a landscape as may generally be found in one picture; for instance, the view of the Castle of Chillon, a popular picture for the magic lantern, to which that of the Prisoner of Chillon in the Dungeon makes an exceedingly interesting contrast. The scene opens with a fine terrace or road (edged by a low wall) winding up towards the castle; in the foreground is a picturesque group of peasants; in the middle distance are precipitous rocks, some crowned with fine trees, also green mounts and slopes, gradually descending to a beautiful sheet of water, on the edge of which stands the castle, jutting boldly out and casting its long shadows on the glassy surface, the monotony of which is broken by the appearance of a small skiff gliding onward under its broad white sail; in the extreme distance rise the blue mountains, which, with the summer sky and clouds, form a glorious background to a highly interesting scene. The ingenious pupil will readily perceive that the castle might be replaced by a water mill, an ancient abbey, or chalet; the figures of the peasants by monks, soldiers, sportsmen, or others; yet the general treatment of these subjects may be the same, the outlines and local colour only being altered; and that this picture is not (although very beautiful) chosen for itself alone, but as an example of a class.

ALBUMEN OPALOTYPES.

MR. WILLIAM BELL, Photographer to the Army Medical Museum at Washington, contributes to our esteemed contemporary the *Philadelphia Photographer*, of which we have received advance sheets, the following formulæ:—

Albumen for Pictures on Plain Opal Glass and Fine Negatives.

No. 1.—Albumen 6 ounces
Concentrated ammonia 1 drachm.

Albumen for Pictures on Ground Opal Glass and Strong Negatives.

No. 2.—Albumen 6 ounces
Chloride of ammonia 6 grains
No. 1 solution of oxide of silver $\frac{1}{2}$ drachm.

Solution of Oxide of Silver.—No. 1.

Ammonia 1 ounce
Oxide of silver 40 grains.

Put the ammonia and oxide in a strong vessel, stir well, and add nitric acid until the solution is slightly milky, *but not acid*. Filter, and it is ready for use in albumen No. 2.

Silver Solution.—No. 2.

Oxide of silver 240 grains
Concentrated ammonia 4 ounces.

Put the ammonia and the oxide of silver in a strong vessel. Stir well, and add nitric acid, C. P., until the solution is *decidedly acid*. Now add 12 ounces of alcohol; filter.

Silver Solution.—No. 3.

Nitrate of silver 70 grains
Distilled water 1 ounce
Alcohol 16 ounces.

Dissolve the silver in the water, add ammonia until the precipitate first formed is just re-dissolved; pour out one-half into a bottle, and to the other half add nitric acid until it is just slightly acid; mix the two together, and add the sixteen ounces of alcohol; filter.

Toning Bath.

Acetate of soda 36 grains
Chloride of calcium 36 "
Chloride of gold 1 grain
Water 12 ounces.

Fixing Bath.

Hyposulphite of soda 1 ounce
Water 16 ounces
Alcohol 3 "

Beat separately No. 1 and No. 2 albumen to a stiff froth; take the settled solution and coat the opal-glass while wet, and stand to dry at this angle \searrow , albumen side downwards. Dry without heat, and, as the plates keep well, a large quantity can be coated at one time, and, when dry, stored away in a dry place. Take the prepared plate, and dip it into silver solution No. 2 for one minute, then wash it with water until the water flows smoothly from it, drain well, and flow it two or three times with silver solution No. 3, and dry; when dry (if properly done), the surface will be free from any crystallization, and very bright and clear. Print deep. After printing, take the plate and flow it with alcohol, wash off the alcohol with water, tone, fix for three minutes, and wash for one hour. Caution! never take the plate out of the hypo, and plunge it into, or wash it with, a heavy stream of water, but let the water flow gently into the fixing bath. After a little while it then can be washed in a good stream of water. This mode of washing will prevent bubbles forming under the film and the spoiling of the picture. Be sure and have the place where the plates are coated with the albumen perfectly clean. Dust-spots create the troubles most met with.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE Fourth Annual Meeting of this Association was held on Tuesday evening, the 28th ult., the Rev. G. J. BANNER, Vice-President, in the chair.

After the minutes of the previous meeting had been read and confirmed,

The names of the new officers recommended by the Council were read, and the following were elected:—

President—Rev. G. J. Banner; Vice-Presidents—Messrs. O. R. Green and J. Henderson; Treasurer—Mr. Lewis Hughes; Honorary Secretary—Mr. W. B. Bolton; Council—Rev. T. B. Banner, Messrs. C. Phipps, Forrest, W. A. Wilson, Hubback, Atkins, Wharmby, and Guyton.

The usual votes of thanks were conveyed to all the retiring officers, and the Secretary was requested to tender, in writing, a vote of thanks to the Library Committee for the use of the room in which the meetings are held.

The Treasurer's report and financial statement for the year 1867 were then read, showing the Association to be in a very flourishing condition. Having been audited and found correct, the statement was passed.

Mr. FORREST, on behalf of the President, who was unavoidably absent, moved that an alteration be made in Rule X. of the Association, which reads as follows:—

"The Ordinary Meetings shall be held on the last Tuesday in each month with the exception of the following: June, July, and December," the proposed alteration being to leave out the words "the following: June, July, and."

After a little discussion, the motion was carried unanimously.

Mr. MAWDSLEY then moved that in Rule IX. the word "November" be substituted for "January," the object being to change the date of the Annual Meeting from January to November, in order that a correct list of the officers may in future appear in the almanacks, &c., for the current year.

The Rev. T. B. BANNER opposed the motion, and, after a very warm debate, Mr. Mawdsley withdrew it.

It was then proposed by Mr. MAWDSLEY, and seconded by Mr. COOK, that Rule XI. be supplemented by the following:—"Members elected at the October and November meetings to pay no subscription for the current year, but to be considered Honorary Members for the rest of the session."

The motion was passed unanimously.

Mr. EATON CLIFFE was then elected a member of the Association.

The CHAIRMAN introduced the subject of a soirée; and, after a short discussion, it was resolved to hold one, the Hon. Sec. being requested to call a Council meeting at an early date to make the necessary arrangements.

Mr. GREEN exhibited two of his large pictures (24 by 18) of Furness Abbey, one of which was kindly presented to the Hon. Sec. in recognition of his services during the past year. The other, Mr. Green has been good enough to offer as a prize for the best photograph or collection of six photographs, to be exhibited at the meeting in March, the conditions being that the pictures shall be entirely the work of the exhibitor, and shall be taken between the 1st January, 1867, and the day of exhibition.

There were also exhibited some carbon prints by Mr. Cotton, and some stereo pictures in the Isle of Skye by Mr. Hubback.

The meeting was adjourned until the 25th February.

OLDHAM PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held at Bartlam's Rooms, Horsedgate Street, on Thursday, the 30th ult., the President, Mr. JOHN GREEN, in the chair.

The PRESIDENT, in opening the meeting, said: Gentlemen,—At the formation of this Society it was suggested that it would be more in unison with the feelings of some of the members if the meetings were held elsewhere than at an inn. That suggestion has been adopted, and it is with hopeful feelings for the future that I welcome you to our new abode in Bartlam's Rooms. It must be gratifying to the promoters of this Society to see their efforts rewarded by bringing together and forming into a union so many gentlemen who practise the art of photography in Oldham, and it would be most gratifying if this change of meeting place would induce some of our townsmen who rank high in science, literature, and art, to join us in promoting the advance of an art-science that is destined to hold a very high position in the great discoveries of modern times. The other two great triumphs of genius which mark this age—the electric telegraph and the system of travelling on land and water by the aid of steam power—may be of greater commercial value (for the saving of time in steam travelling and the marvellous speed with which messages can be transmitted by telegraph are of extraordinary value), yet our beautiful art not only greatly aids our industrial and commercial pursuits, but it civilises and educates, and comes home to the affections and sympathies of the human race. It is no small boon to the humble cottager that it enables him to possess as truthful images of those he holds dear as the wealthy potentate could have done previously. What a value the poor widow places on the letter she receives from her only son, who has gone to push his fortunes in some foreign clime! But how much more precious does it become when she finds enclosed within its folds the little "carte-de-visite!" She gazes with rapture on the bit of pasteboard where stands the manly form of him who is now her only joy on earth. It is to our fascinating art that the

world is indebted for that priceless household treasure, the portrait album, on which Eliza Cook thus writes:—

"Just as the summer bee will stray
Where rich bloom fills the woodland dells,
Bearing the luscious drops away
That help to store its golden cells,
So do we gather in this book
The great, the good, the kind, the dear,
And bless the pages while we look
On memory's honey gathered here."

I believe that photography, by cheaply circulating the portraits of the philanthropists and other great and good men of all nations, gives us hope that the time is coming when devastating war shall cease, and when

"Man to man the world o'er
Shall brothers be for a' that."

I will just glance at the arts and sciences that have been benefited by photography. First, then, the science of chemistry, the parent of our beautiful art, has been repaid with bountiful interest for the nurture she gave her young protégé. The practice of photography has so popularised the chemical art as to have called into existence a new generation of chemical students. It has infused a wonderful zeal into the study of chemical science, and has caused thousands to read and study the works of our most established practical or theoretical chemists, and it is probable that even now we may be nurturing some embryo Davy or Liebig among our young and ardent photographers. The requirements of our art have called into existence several totally new combinations of matter, and wonderfully cheapened the cost of productions of some of the most useful chemicals and drugs. In medical science, the marvellous rapidity of execution and the minute fidelity of the photographic picture have been of great value in recording every varying phase and form of disease, and delineating with accuracy interesting surgical cases before and after an operation. In comparative anatomy, the minute details of the animal frame can be easily represented, and copies multiplied by the skilful photographer.

The faithful transcripts of nature produced by the camera add a new charm to the delightful studies of the botanist, the naturalist, and geologist. The geologist is indebted to our art for the accurate representations of birds and animals as yet unacclimatised in this country; and some specimens in mineralogy which crystallize in such complicated groups as to be excessively difficult of imitation have been easily copied by our art. Astronomy owes much to our art-science, and there is now a staff of photographers attached to all the observatories in the world. Warreu de la Rue has taken photographic maps of the moon, which possess such wonderful minuteness of detail that it is easy to measure the height of her mountains and the depth of her valleys; interesting photographs of the planets Jupiter, Saturn, and Mars have been taken; and lunar and solar eclipses and other remarkable phenomena have been photographed, which add greatly to the interest taken in the wonders of the celestial world. The architect must feel grateful to an art that gives him such faithful representations of existing edifices, remarkable for grandeur of conception, for beauty of execution, and for comprehensiveness of design. Views of the crumbling memorials of the genius of a past age can now be preserved by the indestructible carbon process, and future ages will bless an art that has preserved the appearance of those interesting ruins that add such a charm to our landscapes in the nineteenth century. The indefatigable photographer is ascending the Nile, tracing the course of the Zambesi, navigating the Ganges, the Yang-tse-Kiang, and the Mississippi; he climbs the Alps, the Andes, and the Himalayas; in fact, he wanders to every part of the habitable globe in search of the beautiful and the picturesque, and sends home for our inspection, at our own quiet firesides, stereographic and other views from all the principal capitals of the world. He gives us scenes memorable for past grandeur and glory; he gives us glimpses of nature unseen before, perhaps, by mortal eyes, and sends home sketches of everything that has borne the impress of human genius or skill; and, I will venture to say, that for truthfulness and minuteness of detail, they are incomparably superior to the best efforts of the painter's skill. I have said nothing of the valuable appliances of photography to civil and military engineering, to mining, surveying, and exploring; in fact, it would take a long time to show all the uses of photography, for there is scarcely a profession or business but might profitably call in its aid. I very heartily concur in the recommendation of our Council, that we hold several out-door meetings

during the year, for I cannot conceive any greater pleasure than a day's ramble with trusty camera and kindred spirits, to scenes of beauty where

"Mountain, river, lake, and grove,
Remind man of his Maker's power and love";

where everything is clad in nature's livery, from the broad majestic oak to the tiny green blade that twinkles in the morning sun; where we are lifted for the time out of the struggles and contests of business life; where our hearts are opened to kindly genial influences, and where we feel at peace with ourselves and all the world.

These are moments calculated to awaken within us a faculty of the human mind which the ordinary pursuits of life often leave dormant: I mean the faculty of perceiving the beautiful in nature and art; a power that enables us to appreciate that beauty which everywhere surrounds us. But men wanting that faculty may live in the midst of beauty, and still not see it: to such men a stone is but a stone; such men cannot distinguish betwixt a Guido and a daub; of such a man Wordsworth says—

"The primrose by the river's brim
A yellow primrose is to him,
And it is nothing more."

But you, my young friends, when you have got this power—this sixth sense, as I may call it, fully developed within you—you may go forth with your cameras in search of beauty; and though she hides in a butterfly or under a leaf, or creeps into the old ivy, or plays hide-and-seek among the sunbeams, or haunts some old ruin, or laughs out of a bright young fern, or, taking the form of a white cloud, she goes dancing over the green fields or the deep blue sea, yet, by your potent art, you can transfix her, and reproduce her lineaments in her loveliest mood on the white screen. I feel proud of being a member of a society whose object is to promote the further uses and appliances of this fascinating art-science—an art that has been fostered by the highest intellects of the land. I earnestly advise our young members to avail themselves of the opportunity of studying the principles of art now so liberally provided by the excellent schools in Oldham, for unless the camera is directed by the artist's eye we can never hope to abolish those caricatures of the "human face divine" that are yet too frequently met with in albums and show-cases. I would just refer to the excellent album and portfolio that the Council have provided for the reception of gifts from members and others, and, I trust, the reading of papers, the exhibition of negatives and prints illustrating successes or failures, in wet or dry processes, and other matters interesting to the ardent photographer, will cause our meetings to be well attended, and insure the success of the Oldham Photographic Society.

[For most of the above remarks Mr. Green is indebted to several papers.]

A vote of thanks was passed to Mr. A. Whitham, of Hollingsworth Lake, Littleborough, for some very excellent cartes for the album.

It was suggested that the Society have a question-box, but the subject was postponed until the next meeting.

A vote of thanks to the President brought the meeting to a close.

Correspondence.

DOUBLE PRINTING.—COMBINATION NEGATIVES.

DEAR SIR,—Two years ago I gave you a plan to produce composition negatives by the use of black velvet. Again I venture to bring before you my method of producing variety in the same negative.

Select a choice bit for foreground purposes, arrange the black velvet (stretched) so as to form a background, being careful to arrange naturally all the grasses, sprigs, shrubs, &c., so that everything falls well in its place; then make a whole-plate negative, well exposed, and from the negative make a good, clear, transparent positive; place this in the window of the studio, shutting out the light all round it; then take the impression from the transparent, and immediately after take the portrait which is intended to make the picture: by this means a bit of the background from nature may be introduced without interfering with the

figure. The figure will fall in its place quite as naturally as if taken on the spot all at the same time.

This transparency will answer for any number of different portraits. The backgrounds can be introduced in the same negative by this contrivance. Go out into the woods and fields when the season comes, and take negatives from all that is likely to be useful: an endless variety can be produced in this way.—Yours very truly,

J. EASTHAM.

[Mr. Eastham's ingenious suggestion will be found in detail on page 70 of our tenth volume.—Ed.]

Talk in the Studio.

PHOTOGRAPHY AT SOUTH KENSINGTON.—The post of Photographer to the Science and Art Department at South Kensington, vacated by the lamented death of Mr. Thurston Thompson, will, we understand, be somewhat modified. For some time past Mr. Thompson had been engaged on duties for the Department abroad, and Messrs. Cundall and Fleming had done much of the work at home. This firm will, we believe, continue doing the same duty, and the post of Photographer to the Department will be undertaken by Mr. Stephen Thompson, who, by culture and experience, is, we believe, well qualified to fulfil the duties, which will be chiefly abroad.

PIRACY OF PHOTOGRAPHIC COPYRIGHT.—On Wednesday, the 29th ult., a suit was brought before the Vice-Chancellor to obtain an injunction against the infringement of copyright in a photographic portrait. This was a suit by Mr. Mowbray, a photographer, of Oxford, against the defendants, known as Messrs. Hatchard and Co., for copying and publishing, as an engraving in a pamphlet called "The Position of the Right Rev. Samuel Wilberforce, D.D., Lord Bishop of Oxford, in reference to Ritualism," a photograph of his lordship, which, as the pamphlet stated, represented him in the attitude of a Romish bishop, with his pastoral staff in one hand and three fingers of the other lifted up in the act of blessing (as symbolical of his authority from the Blessed Trinity). It appeared that the plaintiff had taken the photograph at the request of some of the bishop's friends, and was the proprietor of the negative, which was registered at Stationers' Hall. The defendant's counsel now admitted that there was no defence to the suit, and his Honour therefore granted a perpetual injunction to restrain the defendants from publishing or selling the pamphlet with the engraving inserted, and granted an inquiry as to what damages had been sustained by the plaintiff by the publication of the engraving, and ordered the defendants to pay the costs of the suit.

To Correspondents.

Z. H. A.—The argentometer ceases to be of value for testing a silver bath after foreign substances, such as sugar, have been added to it. If you wish to test such a solution, you must employ one of the instruments—of which there are many in the market—based upon the use of a standard solution of chloride of sodium, which, by converting all the silver in a measured quantity of the bath into chloride, enables you, by weighing the chloride, to estimate the strength of the whole solution. For practical purposes it is rarely necessary, however, to employ such a test. If you keep account of the amount of paper excited on a given solution, and take care to keep adding an ounce of nitrate of silver (and sufficient water to preserve the quantity of both) for each quire of paper floated, you will keep things in pretty good order.

NITRO-GLYCERINE.—The form of glass room of which you send diagram is very good. 2. The dimensions are very good, but five or six feet more in length would often be found useful. 3. The amount of glazing indicated in your diagram will answer well. 4. If you cannot get a north light, nor'-'nor'-west will suit well.

W. H. L.—You may safely purchase the lenses of the best English makers second-hand. The makers will willingly be at the trouble of verifying their own lenses. No. 2, in your list, we prefer.

W. J. A. G.—No. 2 will best suit your purpose for instantaneous work. 2. That marked No. 3 may be used for architecture, provided you use it for a somewhat less size than it will take; but if the straight lines of a building come near the margin of a full-sized plate, they will be curved. 3. It is impossible to describe any developer, or any formula, as best, as everything depends on the result desired, and the conditions under which you work. The best plan is to try those gelatino-iron solutions of which we have

given the formula, and adhere to that which answers your purpose best. The gelatino-iron developers generally give sufficient density at once, without further intensifying; but they may be used as intensifiers. There is no disadvantage in using an iron solution for intensifying; many of the best operators use it. Some continue to use pyro simply because they are accustomed to it, and others because they like the brown non-actinic colour it gives the negative.

G. W.—There has never been any minutely-detailed formula published of Fargier's carbon process. It was described in the *News* when first brought before the French Society in November, 1860. You will find the notice on page 390 of our fourth volume. A little pamphlet in French was published on the subject a year or two ago. The process consists in coating a plate of glass with a mixture of gelatine, colour, and bichromate, and, when dry, exposing the glass so coated under a negative. After exposure it is coated with collodion, and then plunged into warm water. This dissolves the unaltered gelatine, and leaves the image adhering to the film of collodion floating in the water. This has then to be mounted on paper. The difficulty of manipulating the soft and flimsy film, the difficulty of working with the gelatine on plates of glass, &c., stand seriously in the way of any extensive practical application of this process, and the collodion film, which covers the picture somewhat, mars the effect, especially in large pictures. We shall be glad to see your examples.

E. P. P.—Partially boiling down your bath is not of much service. To gain the full advantage of boiling, you should evaporate to dryness. Perhaps the simplest plan you can adopt is to add a few drops of a solution of cyanide to it, just sufficient to produce a slight precipitate; then sun for a few days and again try; if necessary, adding a few drops of nitric acid. A portrait lens is generally used in an enlarging apparatus. Let the focus of the condenser fall on the front lens of the portrait combination.

Z.—We have occasionally met with cases in which the collodion film has cracked under the varnish in the manner you describe. It is difficult to indicate the cause certainly, although several causes may be suggested. We fear that there is no cure. 2. It entirely depends on the kind of resin and solvent employed, as to how you should proceed to remove the varnish from a negative. If amber varnish, chloroform must be applied; if crystal varnish, benzole will answer; if a spirit varnish, then use alcohol, employing fresh quantities in succession, until the varnish is quite dissolved and washed away. The use of alcohol in subsequent solutions which may be applied to the plate will be found useful.

Z. Dobson.—It entirely depends upon whether there is any copyright in the engraving in question, as to whether you may publish photographs of it. You must ascertain that. 2. To make a bath water-tight for the field, place it in a wooden case, a little shorter than the bath. At each side of the top of the case shoulders must be placed. A strip of wood is lined with pure sheet india-rubber to cover the orifice of the bath, and this is kept in contact by a couple of brass clamps, which grasp the shoulders on the case. You will understand the matter much better by getting a sight of a water-tight bath than by a description. You will decidedly find the *YEAR-BOOK* useful.

H. WILCOX.—We should use the card lens for enlargements, stopping it well down, of course. 2. You overlook the fact that to copy and publish any man's works without permission would be very improper, especially where, as in this case, all the pictures are private portraits. 3. Systems of exchange have often been attempted; but, in all cases which have come under our attention, they have been sources of dissatisfaction. It is difficult to effect such exchange without personal examination.

W. W. LAWSON.—It is probable that, with skilful management, good results may be obtained in such a room; but it will require judgment in management. Neither the form nor the aspect are such as we should choose.

LENSES.—We think the most rapid of the two lenses will answer your purpose best in all ways.

AMATEUR.—The streaks of which you send us example are very curious indeed, and altogether unlike those which arise from over-iodizing, or those which often arise in the direction of the dip. We cannot with certainty indicate the cause. Are you sure the plates were quite clean? Had they been used for negatives before? Some imperfection of this kind is the most likely cause.

A. O. E. L.—If prints are only slightly washed, or not washed at all before toning, they tone quickly; but the toning bath is fast impoverished; no harm beyond that usually happens. If you touch the toning bath with fingers which have been in contact with hypo, the bath is quickly spoiled; a sulphur compound of gold is formed, and the bath turns brown and is inert. The only plan is to throw it into the stock of residues.

G. NICOLSON.—Frith's views are published by himself at Brightlands, Reigate, Surrey. 2. The stereo magazine used to be published by Lovell Reeves; but is, we believe, no longer issued. 3. We have not examined the book, and cannot speak certainly.

W. GALE.—One cause of your difficulty in obtaining vigorous negatives of reproductions with the materials which work well for landscapes and portraits is probably that you work with a very small

stop, and the more feeble the light which reaches your plate the more difficult it is to get clean and intense negatives. Proceed as follows:—Use a moderately strong bath with a decidedly acid reaction. Use old, full-bodied collodion, giving a creamy film, with sufficient tincture of iodine added to make it the colour of sherry. Expose in a good light and with the largest stop which will give definition. Develop with a gelatino-iron solution, not too strong; fix, and see that, before commencing to intensify, there is no deposit on the parts which should be transparent. If they are not absolutely clear, apply a solution of iodine one grain, iodide of potassium two grains, in one ounce of water, for a few seconds, wash, and apply a very dilute solution of cyanide; this will remove the traces of deposit from the transparent lines. Then, after washing, apply a five-grain solution of bichloride of mercury, until the image is of an even grey tint. Wash, and then apply a one-grain solution of iodide of potassium; this will give you an intense negative of a greenish grey tint. If it is not sufficiently intense it will now readily acquire any degree of density by the application of pyro and silver. But it is all-important to get an image with something of a positive character at the outset. The mercury intensifying process is used at Southampton. Our *YEAR-BOOK* is in print, and has been ever since Christmas week.

J. J. B.—The cost of the apparatus for enlarging by the magnesium light is, we believe, £5 12s. 6d. Mr. Solomon will, however, tell you all particulars. We shall have pleasure in giving you our opinion of your pictures.

CYMO.—It is very probable that the proposed alteration will be an improvement. From the description you give, it is not improbable that the roof, being rather low, a good deal of the light is cut off from the sitter by the sash-bars. Place yourself in the position of the sitter, and look up; if you see that each of the sash-bars cut off from your sight a portion of the sky, all that is so much practical loss of light.

G. C. M.—When once a print has begun to fade, no amount of washing will, we fear, prevent it. Placing between two pieces of blotting-paper which have been moistened with a solution of bichloride of mercury has sometimes partially restored a fading print.

ASTHETIKOS.—Failing the opportunity of securing a north light, north-east will be next best.

PIERRE REYON (Gray Haute Saone).—The two defects with which you are troubled are especially incident to the tannin process, and have never, so far as we know, been entirely overcome. For preventing the transparent insensitive spots, it has been proposed to give the plates a preliminary coating of very dilute solution of albumen; but whether this is always efficient or not we cannot say. The tendency in the latent image to become gradually effaced if the plate be kept too long before development is a peculiarity of the tannin process for which there is no remedy. 2. The addition of honey, or similar substances to the honey, only tends, we believe, to hasten the disappearance of the image. 3. The collodio-albumen process, with a final wash into a solution of gallic acid, is the best keeping process we know. The modified gum process described in our *YEAR-BOOK* by Mr. Gordon is an excellent keeping process. 4. With some samples of collodion, when using the last-mentioned process, the film has a little tendency to leave the plate, but with an adherent collodion this is not so.

H. P. (Thirsk).—Thanks: we shall be glad if we can find time to avail ourselves of the opportunity of seeing the pictures.

W. FISHER.—As we read and answer considerably over two thousand letters from correspondents every year, you can readily conceive that we do not preserve in our memory every individual design for a studio submitted to us; so that, without receiving another copy, we cannot now advise you concerning one sent some time ago. We can advise you generally, however, that it will be wise to get your light from the side which has an uninterrupted expanse of light.

TOP-LIGHT.—We have an impression that in summer blinds are occasionally used to the top-light; but we described it as it was used in October. Stippled glass obstructs considerable light, and blinds would rarely be required as well. 2. In intensifying with the same iron solution as that used for developing, it is clear that a considerable amount of acid must have been present to check reduction. 3. For blinds to your roof we prefer the scheme marked No. 1, with the blinds half covering the glass, running in the direction of the dotted line D and E. We should not cut off any of the side-light. Thanks.

S. ARLIDGE.—Your background is not bad for a first attempt; but it is a little too much pronounced. A larger style of painting, with fewer objects in the scene, many of them being rather indicated than sharply made out, is most suitable for photographic backgrounds. We shall have pleasure in hearing of the results of your experiment in lens making.

Several Articles again stand over.

Several Correspondents in our next.

. All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
Changes in Photographic Glass	73	The Magic Lantern and Photography. By James Martin.....	79
The late Sir David Brewster	74	Researches on Dry Processes. By M. Carey Lea.....	80
Description of an Improved Frame for Photographic Printing.		Tax the Sun.....	82
By Arthur Taylor	74	Proceedings—North London Photographic Meeting—London	
Glass for Photographic Purposes: and the Changes to		Photographic Society.....	82
which it is Subject	75	Correspondence—M. Salomon's Portraits	83
Pictorial Effect in Photography. By H. P. Robinson.....	77	Talk in the Studio	83
On a Wet Method of Reducing Chloride of Silver. By Dr.		To Correspondents.....	84
Graeger	79	Photographs Registered	84

CHANGES IN PHOTOGRAPHIC GLASS.

THE extent to which photographers habitually waste light is a question worthy of more careful and more general study than it has ever yet received. Every photographer knows that quality of light is more important than quantity; that no length of exposure will ever fully compensate for lack of purity or brilliancy in the light; and portraitist and landscape photographer alike avoid working, if possible, in foggy weather. Yet it is a literal fact that many photographers are voluntarily working in an artificial fog, or its equivalent. Many are continually working in studios with an accretion of dirt on the glass which renders it as impervious to light as ground glass; and many more are working with glass which, whilst kept clean, has undergone a gradual change under the action of sunlight which has made it retard the passage of actinic rays in an almost incredible degree.

At the last meeting of the North London Photographic Society we brought this subject before the members, chiefly confining ourselves to the condensation of the record of a series of interesting experiments by Mr. Gaffield, of Boston, U.S., with a copy of which he had favoured us. We then briefly referred to cases which had come under our own knowledge, in which a thorough cleaning of the glass of the studio had reduced the exposure one-half. Since then the details of a case were brought under our attention in which the change effected was much more startling. An eminent photographer was asked to inspect a glass room which appeared admirably built and arranged, and in which excellent pictures were obtained, but which, from the length of exposure required in it, rendered the studio comparatively useless. A careful inspection of the glass induced him to ask for hot water and flannel, and a transparent, brown film or varnish, the accretion of many years, was removed. After a perfect cleansing within and without, a picture was again tried, and it was found that the exposure had been reduced from sixty seconds to ten seconds. And yet the accumulation of deposit on the glass had been so gradual, and it was so much of the character of a thin, tenacious, but non-actinic film, that it had never excited suspicion until examined by a gentleman to whom it had not grown familiar. A similar case was brought under our attention in relation to an excellent quarter-plate—Voightlander's portrait lens—once excellent, but which had grown so slow as to be worthless, an absolute change in the colour in the glass being suspected. The lens had so deteriorated that it was offered for sale for five shillings. A friend suggested to the owner examining the surface of the glasses, and received reply that they had been continually carefully wiped and polished. It was resolved, however, to give them a thorough cleansing with a tuft of cotton-wool dipped in alcohol. This at once revealed the presence of a yellow film, which had before resisted cold water and gentle wiping. Each lens of the combination being thoroughly

cleansed, the lens recovered its original rapidity, and became worth as many pounds as it had been offered for shillings. Every one who has given attention to the subject must be aware that the film which gradually deposits on surfaces of glass is often very tenacious, insoluble in water, and not easily removed by ordinary rubbing. The use of alcohol, dilute sulphuric acid, or (what is too little known) a strong solution of sulphate of magnesia, will generally be found efficient either for lenses or other glasses.

The effect of colour in glass, and the changes made by the action of light, receive, perhaps, less attention than those made by dirt; but they are less understood and less under the control of the photographer. Mr. Gaffield has very definitely proved a fact to which we have before called attention, namely, that the most colourless glasses are most liable to injurious change; and he has further ascertained that almost all kinds of glass are liable to change under the long-continued action of sunlight, twelve months sufficing to alter the colour of every sample exposed except a common sample of American sheet glass. Fortunately for the builders of photographic studios, the commonest glass, as a rule, is least liable to change, English crown bearing—in this country at least—the best character in this respect. But it unfortunately happens that some samples of this glass, of one-eighth of an inch thick, cut off as much as 13 per cent. of light. M. Pelouze has stated his belief, in the *Comptes Rendus*, that there is not a single species of glass to be found in commerce which does not change under the action of light. But Mr. Gaffield has found that a sample of optical glass did not change in two years.

There are three practical questions arise out of a consideration of the subject. First—Can glass be made which shall not change? The second is a compound question—What kind of existing glass, not obstructing much light, changes least, and which most? And, thirdly—What kind of changes are least injurious photographically?

In answer to the first, Mr. Gaffield states that if manufacturers would make glass of materials free from impurity, a glass free from risk of change might be produced. The common impurity is oxide of iron, which, in the form of a protosalt, causes greenness in glass, and in the form of a persalt causes yellowness or brownness. To correct the green tint caused by iron, oxide of manganese, or "glass-makers' soap," is added. A portion of the oxygen combining with the iron salt changes the green into yellow, and, thus corrected by the pink tint of the manganese, gives a comparatively colourless effect. The balance upon which a colourless condition is based being easily affected by light, the changes to yellow or pink are produced. The only stable freedom from colour must be gained, it seems, by the use of pure materials and a careful abstinence from the addition of manganese. Will glass manufacturers make the experiment in behalf of photographers?

In answer to the second question, the existing samples of white plate change most readily, becoming yellow; and next to this, white Belgian sheet, which quickly changes to pink. The least easily changed are common sheet and crown glass, either English or Belgian. Samples of a bluish green tint obstruct least light when new, and are least liable to injurious change.

The kind of change least injurious in glass for photographic purposes is obviously that inclining to lavender or purple, that tending to yellow being most injurious. We recently tested two samples of thick plate glass, such as is used in printing frames. Both had been colourless; one had acquired a slight yellow tint, but still looked clear and brilliant; the other appeared much darker and inclined to purple. A piece of sensitive paper being exposed under them for five minutes, strikingly illustrated the resistance to actinic light. That with the purple tint obstructed very little light. Estimating the uninterrupted action of light on the paper as 7, that under the purple tint would be 6, and that under the yellow tint about 4. Photographers contemplating glazing studios cannot, unfortunately, make practical tests with advantage, as few would care to wait six months—the shortest exposure giving any trustworthy indications of the character of any glass to be examined. Until a guaranteed sample is in the market, relying on the indications we have given, and occasional examination of the glass, and, if necessary, reglazing, are the only resources he possesses.

No available means have been discovered of restoring the purity of glass changed by light. Some time ago Dr. Percy called our attention to the action of heat in removing the pink colour produced by light, and Pelouze has made similar observations; but baking the glass in the studio is not readily effected. It is easier to break a few, at least, of the panes through which the dominant light enters, and renew them by the lightest sample of bluish green window glass to be procured.

THE LATE SIR DAVID BREWSTER.

ANOTHER of the foremost men of science of our day, and an able contributor to the scientific advancement of photography, has left us. Sir David Brewster has died in his eighty-seventh year, having been born in December in 1781. His life has been for nearly seventy years actively engaged in the pursuit and promotion of science, his labours being recognized in his twentieth year by an honorary degree as M.A. conferred by the Edinburgh University. Scholastic honours from various sources followed, and in 1831 he was made a Knight of Hanover, and in the following year received an English knighthood. His labours have been devoted to many branches of science, but the science of light has secured his chief attention. His works on optics, on the polarization of light, and other branches of the science of the sunbeam, are well known. One of the most valuable labours of his life was the effort made in forming the British Association for the Advancement of Science, of which he was the virtual founder. His practical inventions were not less interesting than his contributions to abstract science. Of the indirect aid which his labours have lent to photography it would be difficult to speak with precision, they are variously ramified; but his contributions to the perfection of lenses, and his invention of the lenticular stereoscope, are well known. He preserved at all times a deep interest in photography, and in the Photographic Society of Scotland, of which he was President. He contributed to photographic literature various interesting articles in the *North British Review*, and elsewhere. He manifested a deep interest in the recent discussions on the improvement of photographic lenses, in which the late Mr. Claudet and others were engaged, and maintained with that gentleman an animated correspondence on the subject, with a sight of which Mr. Claudet from time to time favoured us. In a recent letter, he enclosed to Mr.

Claudet a small photograph of a very humble cottage in Jedburgh, with an inscription intimating that it was the house in which he was born upwards of eighty years ago. Although Sir David had been seriously ill for a little time before he died, he had retained the vigour of his faculties to the last, having continued his scientific labours until within a very short period of his death.

DESCRIPTION OF AN IMPROVED FRAME FOR PHOTOGRAPHIC PRINTING.

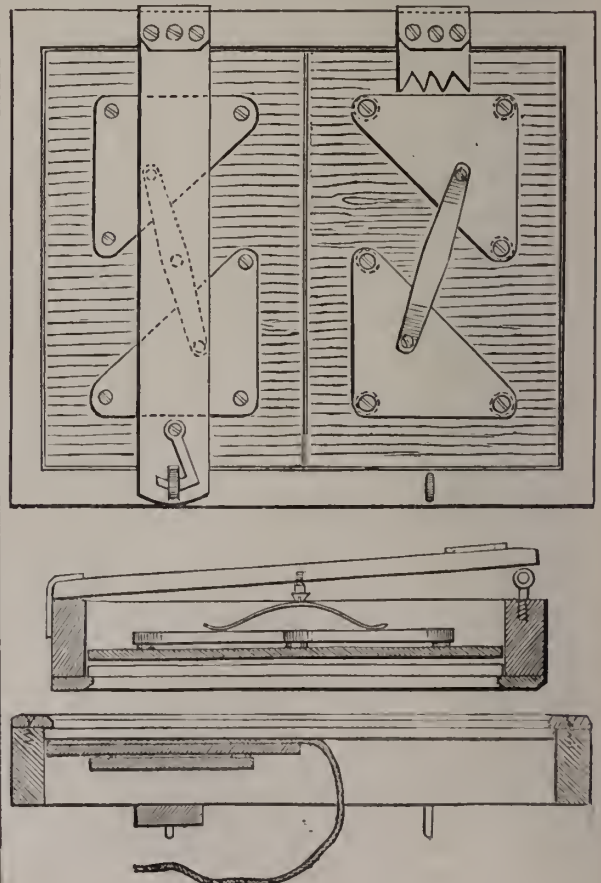
BY ARTHUR TAYLOR.

COMPLAINTS have frequently arisen as to the inefficacy of the pressure frames used for photographic printing in procuring that equable contact between the whole surface of the negative and the sensitive paper which is essential to the production of good prints.

There is, no doubt, much ground for these complaints, especially where large frames are used in hot climates; and the defect seems to arise from the fact that, in the frames commonly used, the pressure is applied at one or two points only of the boards forming the back of the frame; so that, to effect an equable pressure at all points of its under surface, the backboard must be a true plane, and, moreover, perfectly rigid.

Backs of plate glass have been used in some cases, but they are hardly applicable to large frames; for although they certainly fulfil the first of the above conditions, they are open to objection on the score of weight and fragility, and unless very thick, they are not sufficiently rigid; whilst, on the other hand, those made of wood, in the usual way, are very apt to warp, and an exceedingly slight deformation in this part is fatal to the proper action of the press.

The annexed drawing represents a form of printing-frame



in which the above-mentioned causes of imperfect action are avoided. Several frames on this plan, of a size 14 inches by 11 inches, have been in use for the last six years, and although the printing has usually been done in the hot sun of the south of France, they are still in perfect working order.

As the drawing is made to scale, it gives the relative proportions of the parts, suitable for forms of various sizes; but the following description is that of one of the above-mentioned frames, measuring about 14 inches by 11 inches in the clear.

The frame itself is box-shaped, the sides being about seven-eighths of an inch thick, $1\frac{1}{2}$ inch deep from back to front, and carefully dovetailed together. The front part of this frame having been worked thoroughly out of winding, slips of wood are screwed on, which form the rebate, to receive a plate glass about three-sixteenths of an inch thick. In some instances, sheet caoutchouc has been placed between the frame and the slips forming the rebate, so as to make an elastic and water-tight bearing for the glass.

The back is divided into two equal parts, which may be opened separately. These backboards are of flexible wood, one-quarter inch or five-sixteenths of an inch thick, with the grain in the direction shown in the drawing, and no attempt must be made to stiffen these boards by framing the ends, or otherwise, for it is essential that they should bend freely. On each backboard are placed two pieces, having the form of right-angled triangles; they are of one-quarter inch board, and are attached to the backboard by a wood screw at each corner, but each screw passes through a small washer of sole-leather, placed between the backboard and the triangle. These discs of leather form the bearing-points of the triangles, and they are distributed in such a manner that each occupies the centre of an equal area of the backboard.

A curved steel spring, about one-sixteenth of an inch thick and one inch wide, rests its ends on two points situated in the adjacent triangles; these points being the centres of gravity of the triangular surfaces. The ends of the spring are curved up, and are attached to the wood by screws passing through oblong holes in the spring in such a way as to allow a certain amount of play.

Finally, over each spring is placed a cross bar, two inches wide by half an inch thick; this cross bar is hinged on one side of the frame, and may be secured on the other side by a hook and staple. A short, but rather thick, round-headed wood screw is set in the under side of the cross-bar in such a way that the hemispherical head may rest in the centre of the spring beneath.

Now, when the cross bar is pressed down, the pressure is transmitted to the spring, and is divided between its two extremities, which press with equal force on the two triangles; these two secondary pressures, again, being applied to the centres of gravity of the triangles, are decomposed into six perfectly equal pressures, acting on the backboard through the bearing-points; these last being, as before explained, equally distributed over the area of the backboard, it follows that the pressure originally applied to the crossbar is disseminated in a very equable manner over the whole area of that part of the back which it is intended to compress. A piece of thick woollen blanket, placed under the back, still further equalizes the pressure, and transmits it to the sensitive paper. Between the blanket and the backboards should be placed a piece of thick paper or of card.

The backboards are, of course, liable to warp, but this is of no practical importance, for being, as before stated, thin and pliant, they yield to very slight pressure on the crossbar, and mould themselves, as it were, to the form of the surface beneath. If thought necessary for any special purpose, this last action may be still further facilitated by sawing the backboards nearly through from the back, and midway between the bearing-points, thus dividing the boards into a series of equal and nearly independent parallelograms, each with a bearing-point in the centre.

The amount of pressure is easily regulated by means of the screws in the crossbars, and, once set to suit any given negative, remains constant, however often the frame may be opened.

The crossbars are made of hard, elastic wood, such as ash, and their hinges of thin sole-leather. Metallic hinges are objectionable, for unless they are oiled they wear rapidly, and the fine metallic dust from them may occasion spots on the prints during the process of fixing. It has not been found necessary to hinge the backboards together, though, of course, it may be done if thought desirable.

It may be mentioned that the frames above described have, as yet, been used almost exclusively for printing from paper negatives, the positive paper employed being very thick and hard drawing-paper, frequently requiring a very heavy pressure to flatten it; the pressure distributed over the whole area of the front glass has commonly been one hundred and twenty pounds or more, yet none of these glasses have ever given way, as would, no doubt, have been the case had such a pressure been at all localized. Of course this amount of pressure is only required for special purposes, and the construction of the frame admits of its being moderated to any extent to suit the fragility of glass negatives.

It must be particularly remarked that, when printing from glass negatives, it is essential that the plate should be nearly the whole size which the frame is made for, as it will at once be seen that a small plate placed in a large frame would receive a very irregular pressure. This, however, can hardly be considered as an imperfection peculiar to the frame proposed, for none of those in common use is free from it.

The same principle can be employed in the construction of frames much larger than that described; and if, for very large sizes, a greater number of bearing-points is desired, they can always be so connected by triangles and levers as to divide the pressure of the crossbars equally amongst them.

When it is not necessary to examine the print during exposure—as, for instance, in carbon printing—the frame might be made with a single crossbar; and if, on the other hand, it is desirable to uncover more than half the print to facilitate its examination, three or more sections of backboard, with corresponding crossbars, may be used. It may be observed, in conclusion, that these frames, being very easily made, should not be costly.

Marselles, January, 1868.

GLASS FOR PHOTOGRAPHIC PURPOSES: AND THE CHANGES OF COLOUR TO WHICH IT IS SUBJECT.

BY G. WHARTON SIMPSON.*

It is not a little remarkable that a substance like glass, entering so largely into the consumption of the photographer, and so materially affecting his operations in a variety of ways, has received so comparatively little attention, is so comparatively little understood, and remains so much beyond his control. Photographers will study with anxious concern to secure a collodion which shall give them an increase of sensitiveness amounting to 10 per cent., and would consider a developer which reduced their exposures by 15 per cent. a boon beyond compare; and yet it will often be found that they are shutting out light from their studios amounting to 25 or even 50 per cent., without the slightest feeling of concern. Even in the matter of dirt accumulated on a skylight, I have often been astonished to see it allowed to collect year after year, obstructing light to a most serious extent. And I have known cases where, after a thorough cleaning of all the windows in a studio, the exposures have been reduced one-half.

General experience has taught, what special experiment

* Read before the North London Photographic Society, February 5th, 1868.

has confirmed, namely, that almost all kinds of glass change under the action of sunlight. Different kinds of glass change in different degrees, and the change which takes place varies in kind as well as in degree; some samples tending towards yellow in their change, and some towards pink or purple. The former change is of by far the greatest importance to the photographer, inasmuch as it has been ascertained that a very slight tinge of yellow will cut off 25 per cent. of the actinic rays, whilst the change towards the purple, although of course it cuts off some light, transmits, as we should expect, the actinic rays much more freely, as I shall presently illustrate.

As this question is of vital importance, not merely in regard to the glass employed in our studio, but also in regard to the glass employed for negatives, which are often noticed to print slower after long exposure, the subject is, I think, well worthy of a much more careful attention from photographers than it has hitherto received.

My duty will be chiefly confined to bringing before you the most important points in an interesting paper on the "Action of Sunlight on Glass," recently contributed by Mr. Thomas Gaffield to the *American Journal of Arts and Sciences*, in which he describes a most exhaustive series of experiments. These have been conducted during four years with about sixty varieties of glass, the results having been carefully tabulated. In some cases the records contain the changes observed from day to day, in others from month to month, and others from season to season. The glasses examined consisted of one specimen of optical class; a few kinds of flint glass and glass ware; sixteen kinds of French, Belgian, German, and English plate glass; four kinds of American, English, French, and Belgian rough plate; two of American and English crown glass; ten kinds of American, Belgian, French, and English white sheet glass; four kinds of American, Belgian, and English ordinary sheet glass; fifteen kinds and shades of English coloured glass, four of opaque, white enamelled and ground glass, and one piece of the rough metal of American sheet glass.

It will be noted that Mr. Gaffield's experiments not only confirm what was known in this direction, but materially extend the domain of our knowledge; and further experiments, to be extended over ten or more years, will, there can be no doubt, throw still more light on the subject. In the meantime, his experiments commenced in 1863, and, continued since, are very interesting; and the extracts or abstracts I shall make from his paper will, I believe, be found of much value to photographers.

The first experiments, in July, 1863, proved that,— "a month's exposure to a hot sun would change the best white French plate and all white sheet glass, such as is used for photographs and engravings, to a colour containing more or less of a yellow hue. The dark green and dark blue or bluish green did not experience any change; but any hue which approached a white, whether bluish, greenish, or yellowish white, turned to a yellowish colour.

"A second series of experiments, commenced in July, and continued three months, on some thirty specimens from France, England, Belgium, Germany, and the United States, only confirmed the results of the first; and a daily examination at first, and afterward from week to week, and month to month, revealed the interesting fact that, even after a single day's exposure to a July sun, the change of colour would, in some instances of the lightest hues, commence."

Further experiments in the same direction were tried, with similar results; the samples of glass employed being, in each case, "what is called colourless window-glasses, although they varied in tinge and hue from the whitest improvement to the darkest green English sheet-glass. An Mr. Claudet and four months, from July to November, on that gentleman an ²³—red, green, yellow, blue, and purple object, with a sight of ²⁴—in the purple, which became time favoured us. In a recent

changed thus seriously, he "noticed that the dark green, blue, and bluish-green did not change. The colour of the Belgian sheet (called German or French by glassdealers in America), a yellowish or brownish-green, did not change; and these were the only exceptions. All plate-glasses changed, except an inferior blue quality, and a superior crystal plate of a greenish colour, made in Germany, and at the only factory which has not given up the use of potash for soda-ash."

During the first course of experiments he found that many examples of sheet, plate, and crown glass, with various tints of green, bluish green, and yellowish green, which remained unchanged during an exposure of three months, in twelve months, underwent similar changes to the colourless glass, one sample only—an ordinary American sheet of a bluish green tint—remaining unchanged after a year's exposure.

The gradual nature of the change, and the different tints obtained, in some samples are interesting, "commencing in a day or a few days in summer, from greenish or bluish white to a yellowish white, or light yellow, a deep and deeper yellow, until it becomes a dark yellow or a gold colour; and in some Belgian sheet specimens, a gradual change, commencing in a few weeks in summer, from brownish yellow to deeper yellow, yellowish pink, pink, dark pink, purple, and deep purple; and some kinds of greenish white glass would, after exposure, assume a bluish tint or bluish white."

The following memorandum of the changes during a year's experiments presents the results in a clear form, useful for reference:—

Memorandum of Nine Different Kinds of Glass exposed from Jan. 12, 1866, to Jan. 12, 1867.

Kind of Glass.	Colour before Exposure.	Colour after Exposure.
French white plate	Bluish white	Yellowish colour
German crystal plate	Light green	Bluish tinge
English plate	" "	Yellowish green
English crown	" "	Light purplish colour
Belgian sheet	Brownish yellow	Deep " "
English sheet	Dark green	Brownish "green "
American crystal sheet	Light bluish white	Purplish white
" " "	Lighter bluish white	Light yellowish green
" ordinary "	Bluish green	No change

"The colours named above are given from an observation of the glass edgewise, by which one can see a body of colour two or four inches in depth, whereas the usual thickness of the glass varies from one-fourteenth to one-quarter of an inch, and shows its colour easily only by placing a white curtain or paper behind it."

An incidental observation is interesting, as illustrating the comparative actinic power of the sun's rays during different months. Mr. Gaffield says:—

"I have tried several experiments showing the effect of sunlight during each month and each season of the year. At the end of the year, by the comparative depth of yellow or purple colour produced in the various specimens, one can see the comparative actinic power of the rays during each month and season. The results proved that the actinic effect increased from January to July, and decreased after that month. The greatest effect during any season was observed in the summer, the least in winter, and that in spring and autumn was about alike, and midway between that of summer and winter."

Some other incidental observations as to the power of various glasses to transmit the actinic rays should not be omitted here. Mr. Gaffield remarks:—

"The comparative power of glass of different kinds to transmit the actinic rays, I have tested by placing underneath pieces of each kind, pieces of easily-changing glass (white plate or Belgian sheet glass), exposing them one year, and noticing, at the end of that period, the comparative depth of the yellow or pink colour to which the under pieces had changed. The result of my experiments proved that the most easily transmissive of the colourless glasses were the English crown, French plate, two kinds of white

crystal sheet made in Massachusetts from the celebrated Berkshire white sand, the new Jersey sheet glass, one kind of English plate, and one kind of Belgian sheet, and about in the order which I have named them.

"Of the coloured glasses, the blue transmitted the most, the purple less, the red and orange the least, the glasses under these two and the yellow and green showing little or no change.

"This last experiment proves the propriety of the preference given by photographers to blue glass for skylights, because it transmits the blue rays, which exert the most actinic power. But it may be added that a colourless white glass, or bluish white—if one which will not change by sunlight to a yellow or rose colour, owing to the presence of manganese, or any other cause—is equally good, as it will transmit all the rays, and among them the actinic or blue ones. In proportion as any kind changes to a yellow or rose colour, it will lose its power of transmission and its value as photographic glass. I have seen specimens of the two kinds of white crystal sheet made in Massachusetts before alluded to, which answered the demands of photographic artists. Of foreign glass, I have noticed a fine bluish white sheet, made lately without manganese, from a certain excellent manufactory in Belgium, and one kind of English crown glass.

"Should plate glass be required, the most permanently enduring, or least likely to assume a yellow colour, are a superior kind of white plate, made by the French and Belgian Plate Glass Companies, and an excellent quality of German crystal plate, made at a long-established factory in Hanover.

"I desire to say here, however, that it is not the place where any glass is made which determines its good character, but the actual constituent materials and the superiority of its manufacture.

"Manufacturers are frequently changing their mixture or 'batch,' so that any results given with one set of samples might differ from those made with another set from the same manufacturers. For this reason, in noticing any differences which may occur in experiments made by any of our readers, this fact should be considered as an explaining cause."

After stating some experiments for the purpose of proving that it is to actinism alone, and not to heat, moisture, &c., the change is due, Mr. Gaffield proceeds to state his view of the cause of the changes, which are due to the metallic oxides present. He says:—

"We will briefly state the part which the oxides of iron and manganese play in glass making. In almost all kinds of window glass, and in some poorer qualities of flint glass and glass ware, materials are used which are not perfectly and chemically pure. The sand, the carbonate or sulphate of soda, and the lime, one or all, contain slight impurities of iron, the protoxide of which gives glass a green colour. To correct this, after the batch is partially melted, a little oxide of manganese, called *glass-maker's soap*, is put into the crucible or glass pot; some of the oxygen of the manganese flies off to the iron, and converts the protoxide into peroxide of iron. The peroxide gives a yellowish colour to the glass, and this, being complimentary to the natural pink of the manganese, is neutralized, and the glass is thereby made of a light colour. When the sunlight acts upon glass thus made, the nice equilibrium between the oxygen of the iron and the manganese is disturbed, and sometimes the yellow, and sometimes the pink or purple colour is produced. I have produced all shades of the purples, running from pale lavender into the lilac, mulberry, flesh, amethyst, rose, violet, pink, and deep purple. I have produced, or seen specimens, showing all shades of the yellow, from the brownish yellow up to the brightest gold colour, and I have several series of specimens in which the green has gradually changed into the yellow, and the yellow gradually ran into the pink and purple."

The most important photographic application of Mr.

Gaffield's experiments will be found in the following paragraph:—

"My experiments with glasses under other glasses proved which was best for photographers' use, information which all can gain by exposure of the specimens of various manufacturers which may be offered them. The most pure glasses of light green, or bluish white colour, are the best for photographers, and when I say *pure* glasses, I mean those most free from oxide of iron or manganese, but especially of the latter, which, I think, is the cause of nearly all the changes which I have observed."

Before concluding, I should remark that Mr. Gaffield's articles in the *American Journal of Science and Art* contain full details of the careful mode of testing and examination adopted, from which we may conclude that his results, so far as they have gone, are precise and trustworthy, having nothing of the nature of conjecture or guesswork in the mode of conducting them. The subject is, I think, one of most vital importance to photographers, and one well worthy of a very thorough investigation.

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER 3.

"Thus we are agreed:

I crave our composition may be written."—*Shakespeare.*

"Form is matter bounded by lines, which may be either angular or curved."—*Sir Thomas Dick Lauder.*

"The accidental compositions of heterogeneous modes are dissolved by the chance which combined them; but the uniform simplicity of primitive qualities neither admits increase nor suffers decay."—*Dr. Johnson.*

Composition in art may be said to consist of the selection, arrangement, and combination in a picture of the objects to be delineated, so as produce an agreeable presentation of forms and tones, tell the story which is to be elucidated, and to embody the spirit of what it is intended the picture shall represent or suggest. The principal objects to be sought are harmony and unity. By the preservation of a harmonious balance of lines and light and shade several objects are attained. The first and simplest result is the production of pictorial effect, which satisfies the eye without reference to the meaning or intention of the picture. But a higher purpose is also served. The preservation of harmony necessarily involves the idea of subordination, or a consideration of the relative importance of all the parts of the picture, the principal objects being made prominent, and the minor objects made auxiliary to that prominence by the arrangement of lines and masses of light and shade. By a proper distribution and balance of these the principal objects in the picture will be brought prominently forward, and those of less consequence will retire from the eye, and will support or act as a foil to the chief objects of interest. As the quaint old writer on art, Lairese, recommends, "Let the king or prince have the first place, and next his retinue or other proper persons; if there be yet another party to be introduced of lesser moment than these, and yet essential to the composition, put them in the shade without more ado." In short, the grand fundamental laws of composition may be summed up very briefly. They are, unity, balance, and the adaptability of the whole to breadth of light and shade, by which the principal object in a picture—such, for instance, as the head in a portrait—is brought forward most prominently, yet united with the other parts, so that the eye may first see the point of chief interest, and be gradually led over the other parts of the picture. In addition to the above primary necessities in composition, there are many subdivisions belonging to harmony—such as repose, subordination, repetition, variety, &c.—which will be treated of in their place, after the broad principles have been clearly understood.

It is a curious fact that the pictures by all artists that have lived during the last three centuries—or, at least, all those

pictures that have come down to us—appear to have been designed on some fixed principle; and from a consideration of the best works of the great masters it has been found that all the most pleasing and agreeable compositions are formed, more or less, on the leading idea of the triangle or pyramid, the diagonal line and its contrasts (which is a variation of the same thing), and the circle, with its various modifications. From a study of these facts, Burnett and other writers on the subject have divided the art of composition into angular and circular, whilst many of the finest examples are a combination of both forms.

As being of the first importance, and constituting, in fact, the skeleton on which all other parts of this subject hangs, it will be well to first call the student's attention to a consideration of

THE BALANCE OF LINES.

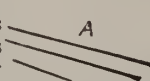
All lines should be balanced or compensated. Without a due regard to this important quality a picture would appear ready to fall to pieces.

Example: Lines running in one direction, whether parallel or otherwise, would give a weak and awkward appearance. A sense of falling is conveyed to the mind by

lines repeating each other thus  It will always

be found possible to produce compensating lines in other parts

of the picture thus  or if lines run diagonally

down a picture thus  a compensation for the lines A is B. There are many other ways in

which oblique lines may be compensated, in a great measure depending on the ingenuity and skill of the artist. Here is an example in a portrait (fig. 1): A girl



Fig. 1.

knocking on a *prie-dieu* chair, is reading a book placed on the back, which faces the spectator. The lines of the head and shoulders above the chair are perfectly compensated by the line of the arm, which runs in an opposite direction; but the lines of the chair, A and B, and of the dress, C, running in nearly the same inclined direction, would have given the effect of insecurity to the figure; and it would be painfully felt that the girl and chair would topple over, which would not have a pleasant effect on the beholder. But to counteract this sense of danger, the lines A, B, and C have been balanced by the line of the drapery D; and this not being sufficient, the table E has been introduced, while the dark spot caused by the book also helps to support the composition, as will be further explained in this chapter. This example is taken from an actual photograph, and shows, as I hope to show by other sketches also taken from photographs, how it is possible for the photographer to apply these rules to his art.

Sometimes the repetition of lines without balance is useful. A good illustration of this is to be found in Frost's pictures of Sabrina and her attendant nymphs descending to the halls of Nereus, engraved and published by the Art Union some years ago, and already familiar, or readily accessible, to all my readers. In this picture all balance of lines and equilibrium of base have been purposely omitted, and the figures appear to descend through the water—an effect necessary to the story.

It may be said that as diagonal or pyramidal lines require compensating, why use them? Why not use the horizontal and vertical lines? To which it may be answered, that there

is not sufficient variety in the last-mentioned lines; a square is much less picturesque than a pyramidal form, as may be seen by comparison of a modern house of square elevation with a Gothic church and spire. Besides, nature never composes in squares; even the horizontal line of the sea is broken by the lines of the clouds and the waves, and that of the plain by trees, uplands, and mountains. Again, a row of standing figures all of the same height, although it is often to be found in photographs, is eminently monotonous and disagreeable; and the very fact that groups of figures are so often photographed in this manner shows the necessity for this work.

The diagonal line (fig. 2) is very suitable in the composition of landscape; it lends itself so admirably to the receding lines of perspective.

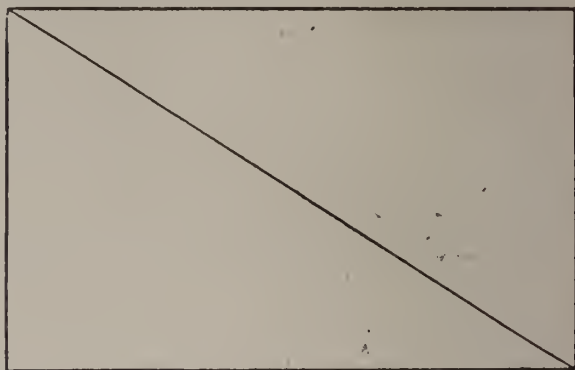


Fig. 2.

Nearly allied to balance of lines is

CONTRAST.

Which is the opposing of things of different aspect to each other, so as to bring out the fullest and best effect of each; such as the position and variety of heads, youth and age, light and shade, &c. Indeed, contrast sometimes supplies the place of balance, as in the sketch (fig. 3), which shows the leading features of a photograph by Mr. Blanchard, whose marine views are always well composed, showing the power of the photographer over subjects consisting chiefly of sea and sky, where the darkest spot—the boat—is opposed to the highest light, and, being the nearest object, is opposed to the most distant, thus giving effect to each other, and being also at the base of the angle, supports the whole, and acts as a kind of key-note to the entire frame-work of the composition. This form of composition, with the endless



Fig. 3.

variations of which it is capable, is most valuable to the landscape photographer.

In concluding this chapter, I must remind the student that in following up the above hints in his pictures he must not allow the art to become too evident, the effect of which would be painful. Just as the conversation of a very learned person is sometimes dull, so would his work be if the student

made too great an effort to show his knowledge. He must not leave room for the critic to say—

"Nature in him was almost lost in art."

The axiom that those who use most art betray the least, is, to a certain extent, true enough; but too great an effort to conceal the art might lead to weakness, and destroy simplicity and character. That which hits the happy medium will be the greatest success.

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 6.

As before observed, the directions and explanations given are not supposed to apply to any particular design, but to explain generally the method of transparent painting upon glass. My readers, remembering that the difficulty of describing a process of colouring without having a coloured illustration to refer to is very great, will pardon me if in part I should appear obscure; in such case do not hesitate to apply to me, and I shall have much pleasure in adding the necessary information through this Journal. Having adjusted your easel at such an height and inclination as may be most convenient for working upon, and in such a position as to be opposite the light, which must be thrown upon the white paper placed underneath, and reflected through the outlined glass or photograph to be painted, which is now separated from the copy and laid upon the easel, he will begin, as in painting generally, with the sky and distances. But I must first state, that in addition to the appliances already named, you must also be provided with what artists term a dipper, which is a small tin cup, whose bottom forms a clip, which fastens it on some convenient part of the palette, and out of which the painter takes the vehicle to moisten his colours from time to time with the tip of his brush. An egg-cup will serve the purpose very well if not required to be fixed on the palette, which is not absolutely necessary for such small work as glass painting. The vehicle generally used is mastic varnish, thinned with turpentine; in cases where the colours to be used are bad driers, a little japanners' gold size may be added, or a French preparation called *siccatis*: by these means, and avoiding the use of oil, the painter may work on without needing to wait for intervals of drying. Take a moderate-sized camel's-hair brush, and, with a little of the vehicle, make a tint of madder lake and Prussian blue; beginning at the top of the picture, lay the colour from left to right evenly all over the sky, so that a pearly grey tint may be produced, gradually melting away at the horizon to almost clear glass; then, with the dabber or the tip of the finger, soften the colour evenly all over, so that it has the appearance of a minute and extremely fine stipple. The darker clouds are formed of Prussian blue, madder lake, and a little gamboge. Be careful to observe their forms and character, leaving their half-lights, which will be retouched with some of the same tint, but somewhat lighter, and having a little more gamboge added. The edges and oppositions of the sky may appear hard; in that case, the application of the finger or dabber will be necessary to soften and blend them; but it must be carefully done, and not overwrought, or the tints will be vitiated. The dangers to be apprehended from a too free use of the dabber are the same as those to which the artist is liable from an excessive use of the softener; the roundness and substance of the forms are lost, and the colours are muddled. It is sometimes useful to have smaller dabbers than can be made of leather; for such, camel's-hair pencils, with their points cut square and then slightly singed round their edges in the flame of a candle, answer the purpose well.

We will now proceed with the mountainous distance. Those forming the horizon or distance are nearly the same tint as the sky, and are devoid of detail, therefore will be represented by a flat tint; but as they approach the middle

distance, the colour increases in intensity until they correspond in tone with the darker parts of the clouds, and a slight marking of details begins to appear. Lay evenly over the tops of the mountains a tint made of madder lake and a small portion of Prussian blue, adding more blue as they approach the middle distance. The lights must be painted with madder lake and gamboge, broken to a warm grey with blue, then blend the whole with a small dabber, taking care to preserve the outlines; the middle distance is composed of the mountains behind the castle, the rocks and green slopes edged with trees, and will prove the most difficult part of the picture from the situation of the light; the mountain behind the castle will be a mass of light and half-light; the second, of shade and half-shade; the third, and nearest, shade and half-shade in a greater degree. Paint in the forms at the tops of the mountains with gamboge, madder lake, and Prussian blue. Continue half way down, then add more lake by degrees, and with this all the dark parts may be laid in, even where most positive in colour. The lights in the tops of the mountain are made of gamboge and madder lake; the light at the base and on the slopes are a greyish green, made by adding a small portion of blue; the dark parts of the rocks are made out with a tint of madder brown and Prussian blue, the lighter parts with gamboge and brown madder. Vandyke brown and blue are used for the darkest markings: the foliage must be laid in with gamboge and madder lake. The bright points of light glancing on the trees are tinted with gamboge only. The dabber must be used to soften every part that requires it, and lights that are troublesome to have can be taken out with the point of the penknife, and afterward retouched with the required tint; and in laying flat tints it will be more expeditious to work over any foreground objects, and afterwards remove the superfluous colour with the stump or a camel-hair pencil containing a little turpentine.

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ON A WET METHOD OF REDUCING CHLORIDE OF SILVER.

BY DR. GRAEGER.*

THERE are many methods of reducing chloride of silver with which we are acquainted, but the majority of them are surrounded by difficulties of some kind or another; either the silver recovered is not perfectly pure, or the manipulation of the process is attended with serious loss, or it is impossible for the whole of the chloride to be reduced at one operation. Now as the reduction of chloride of silver is an operation which has very frequently to be performed, a method whereby these difficulties are overcome will be welcomed with pleasure; and so often have I felt the shortcomings of the methods at present employed, that it has always been my constant endeavour to discover a better and more serviceable mode of proceeding. In making my enquiries, I have always had in view the advisability of seeking for a wet method of reduction, as I regarded the same as the easiest manner of working, and involving less loss of material. The reduction of chloride of silver by means of iron, zinc, or copper in an acid liquid is well known to be an unsatisfactory method, as the product is always found to be contaminated to a more or less degree with the metals employed; the same result occurs if the chloride of silver is reduced by means of copper in an ammonia solution. At the same time, no mention has ever been made of the employment of zinc to reduce the chloride out of the ammonia solution. The probable reason why such an experiment has not been made is on account of the analogy supposed to exist between the two metals, which seemed to promise identical results. As experience proves, however, a very different result is furnished by the employment of zinc, for by using this metal silver of a perfectly pure description may be obtained.

* *Neues Jahrbuch für Pharmacie.*

In fact, the two bodies which act upon one another, the chloride of silver and metallic zinc, are placed under circumstances of a totally different character, as when chloride of silver in a solid condition is brought into contact with zinc in a similar state, in the presence of a free acid. As both bodies act upon one another in a compact condition, the silver is also separated in a like state, and it is well known that fused chloride of silver, reduced by means of zinc, furnishes an adherent mass of metallic silver. During the operation the zinc continues to be dissolved by the free acid, and it is not impossible that this second chemical action, which goes on at the same time, has the effect of again reducing the zinc in the silver, and, both being combined, the acid containing free zinc is powerless to act upon them. If, however, the chloride of silver is present in an ammoniacal solution, therefore, without any cohesion of its finest particles, the metal is separated in an exceedingly loose manner, having the appearance of a very delicate sponge, and at the same time only so much of the zinc is dissolved as there is chlorine given off from the silver. In reality, however, the operation is not so simple as it at first appears to be; for, on the one hand, the zinc becomes covered, during the process of reduction, with a white powder (oxide of zinc), which, on being agitated, becomes dissolved in the ammonia; and, on the other hand, the reduced silver assumes a dark colour from contact with the zinc, which, however, disappears on its being shaken, the product then becoming of a light grey colour. Occasionally a somewhat energetic generation of gas takes place during the operation; whether the same consists of nitrogen or hydrogen I have not yet determined.

In order to reduce chloride of silver by means of zinc, it is first dissolved in ammonia and placed in a bottle, and pure zinc in small excess and in fragments of notable size (so that it may be easily separated after the process of reduction) is then added. The decomposition commences at once, and proceeds so rapidly, especially if the vessel is well agitated, that in the space of three hours a quarter of a pound of chloride of silver may be reduced; the duration of the operation depends, however, of course, on the greater or less excess of zinc present in the solution. A certain excess of ammonia will likewise have the effect of accelerating the operation. At first the precipitated silver assumes a light grey or dirty white colour, but towards the end it becomes dark grey or even black. A few drops of the ammoniacal solution should be examined in a test-tube from time to time, and precipitated with hydrochloric acid; the operation is at an end when no turbidity is apparent on the addition of the acid. When this is the case, the precipitate is allowed to settle down, and the clear liquid then poured off as completely as possible; the silver in the glass vessel is treated again and again with fresh water until all smell of ammonia has disappeared, and is then transferred to another bottle by means of a funnel, the tube of which has previously been stopped with a few fragments of glass to prevent the pieces of zinc from passing through at the same time as the silver particles. The superabundant water is then decanted as completely as possible, and the precipitate treated with concentrated hydrochloric acid, in which it is allowed to digest until the dark-grey colour has given place to one of a dirty white. If the silver contains much water it is possible that it may not become white on a single treatment with the hydrochloric acid; in this case the liquid must be again poured off and a fresh quantity of acid added. By this means the silver may always be obtained of a white colour, and when the operation has advanced thus far the precipitate is repeatedly washed until the water poured off is only very slightly acid. The silver is then collected on a filter and well washed with distilled water; finally, a little dilute ammonia is poured on it, and it is again washed with water. This treatment is rendered necessary in order to remove any minute quantity of chloride of silver which may have been formed by the action of the concentrated hydrochloric acid, the latter sometimes containing small quantities of free chlorine.

The silver produced in this manner is of a very pure description; at any rate, I have never been able to detect the presence in it of any other metal. When dissolved in nitric acid, and precipitated with hydrochloric acid, a fluid is obtained which, when neutralized with carbonate of soda, does not become turbid by treatment either with ferrocyanide of potassium or alkaline carbonates. It assumes a brownish colour on the addition of sulphide of ammonium, owing to the presence of dissolved chloride of silver, but no precipitate is formed.

The expenditure of ammonia in the operation is, of course, not inconsiderable, but, as the greater portion of it may be recovered by distillation, the actual loss of the same is hardly appreciable. In working with large quantities of chloride of silver, economy may be exercised in the use of ammonia by reducing the chloride in several operations, so that the ammoniacal solution of chlorine and zinc, when freed from the silver, is again used to dissolve the chloride. This appears somewhat strange, but is evidently due, in part, to the presence of free ammonia, which exerts an action upon the chloride of silver only when the silver has been separated. Such a mode of proceeding would, however, occur only when manipulating with a considerable bulk of chloride of silver, for, in reducing small quantities, the necessary amount of water required to dissolve the chloride may easily be added.

In the same way, nitrate of silver dissolved in ammonia may also be reduced with zinc, perfectly pure silver being obtained; this result takes place even when the nitrate solution contains copper, as is very often the case. The copper, it is true, becomes reduced by the zinc in the ammoniacal solution, but only very slowly as compared with the silver, and hardly at all so long as a certain quantity of the latter is present in the solution. By this means I have been enabled to separate the whole of the silver from old coins containing but 25 per cent. of that metal. Every particle of silver must not, however, be separated, or, what is the same thing, the quantity of zinc added should be insufficient to precipitate the whole of it. The process possesses the particular advantage that in order to separate copper from nitrate of silver it is not necessary to transform the latter into chloride before it can be reduced. The finely-divided silver must, however, be treated, in the manner described above, with concentrated hydrochloric acid, and afterwards well washed, to remove the particles of precipitated zinc. For the production of pure nitrate of silver this method is especially recommended, as, by its employment, the tedious operations of washing the chloride of silver and its subsequent reduction in crucibles are entirely dispensed with.

RESEARCHES ON DRY PROCESSES.

BY M. CAREY LEA.*

In the present paper I propose to describe two new dry processes of interest. One of them will be found, I think, very valuable; the other, though less generally useful, is the more curious of the two. I shall describe it first, and then pass to the other.

In the first of these processes all the usual manipulations of negative-making are omitted, except the first and last. To say that it is possible simply to collodionize a plate, and then, without further treatment of any kind, to place it in the slide and expose, and, some hours after, to open the slide and take out a finished negative ready for fixing, would seem to be affirming too much; yet it is not only possible, but extremely easy of execution. The simply collodionized plate develops itself spontaneously after exposure, so that the ordinary operations of sensitizing, washing, developing, &c., are all done away with—nothing is left but the collodionizing and fixing.

* *Philadelphia Photographer.*

The process is as follows. A collodion is prepared according to this formula :—

Ether	...	...	...	8 ounces
Alcohol	...	...	...	8 "
Bromide of cadmium	...	...	...	128 grains
Bromide of ammonium	...	...	...	32 "
Pyroxylene	...	...	...	96 "

This collodion is preferable to that which I described in my previous paper; as in the first it is difficult, with strong alcohol and ether, to get so much bromide of ammonium into solution. As this is a very excellent collodion for the collodio-bromide process, I shall refer to it hereafter; I will designate it as *collodion B*. It contains 8 grains bromide of cadmium and 2 grains bromide of ammonium to the ounce, and (taking the equivalent of bromine as 80) it requires, for its exact equivalent of nitrate of silver, 13.47 grains of the latter per ounce.

This collodion should stand for a month before use, in order to ripen properly. It may be used at the end of a week, but slightly veiled negatives are then to be expected.

It is to be sensitized with nitrate of silver when wanted for use. In the present instance we distinguish two cases: where the plates are to be exposed immediately, or where they are to be kept some hours before exposure.

In the former case, where the plates are to be exposed immediately, add to the collodion 16 grains of nitrate of silver to each ounce of collodion. This nitrate is, of course, to be very finely pulverized; it is added to the collodion, well shaken, at intervals, for an hour, or two or three hours, and then let stand two or three hours to settle, or it may wait for twenty-four. Immediately before use, add to each ounce of collodion—

Gallic acid (60-grain solution in alcohol)	24 drops
Glycerine (pure concentrated)	... 20 "

The solution of gallic acid keeps indefinitely, but must have been filtered perfectly clean.

These substances are well stirred up with the collodion. I should have said that the portion to be thus operated upon should have been first decanted quietly from any sediment that had fallen by standing, after admixture with the nitrate of silver.

This preparation of the sensitive collodion is not in the least troublesome in practice. Up to the point of adding the gallic acid and glycerine it answers excellently for any other collodio-bromide process, so that, for those who work the collodio-bromide processes, the production of these plates is especially easy.

The sensitive collodion is poured on the plate after the latter has been edged with india-rubber dissolved in benzole. As soon as it has set, the plate is put into the slide, and exposed about four or five times as long as for a wet plate. The slide is then either put aside, or the plate is transferred to a plate-box, and left for an hour or two in the dark room, when a perfectly developed negative will be found, ready for fixing.

The effect of taking a developed negative out of the dark-slide has something almost magical about it to one thoroughly accustomed to regular photographic routine.

The plate will not usually suffer if left for ten or twelve hours after exposure in the slide. If insufficiently exposed it may, of course, be intensified by any of the usual methods.

In the above case, it has been supposed that the plate was to be exposed at once. But these plates can be made to keep several hours before exposure, by diminishing the proportion of silver, increasing that of glycerine, and adding a little glacial acetic acid, with, however, a decrease of sensitiveness.

Fourteen grains of nitrate of silver, very carefully weighed, is, in such case, the proper proportion. Add to each ounce—

Gallic acid (60-grain solution in alcohol)	20 drops
Glycerine (pure)	... 30 to 35 "
Glacial acetic acid	... 5 to 8 "

This collodion gives a bluish and transparent film, and needs wet blotting-paper at the back. The plate may wait two, or three, or sometimes four hours, before exposure, and several days after it, without injury.

The effect of exposure is curious enough. A plate prepared in the first described method, if kept for several hours without exposure, will fog all over; but if exposed at once, the setting in of the development checks the fogging propensities, and, at the end of ten or twelve hours, the plate is still perfectly clean.

The glycerine is useful, not merely to check the drying, but it checks the disposition to fog, at the same time somewhat diminishing the sensitiveness. If the glycerine be omitted, the plate, at the expiration of an hour or two, begins to dry through; this destroys the sensitiveness, and, even if the plate has been exposed before it sets in, the development ceases as fast as the drying advances.

The process which I shall next describe, though less curious than the foregoing, will be found more generally useful. It also owes its activity to gallic acid, but differs essentially in all its other points.

The same collodion is to be employed, sensitized in the same way, with 16 grains of nitrate of silver to the ounce. When the sensitized collodion has reposed sufficiently, I decant a portion, and add to it a 60-grain solution of gallic acid, in the proportion of 25 drops to each ounce of collodion, stirring well up. Coat the plate, previously edged with solution of india-rubber, one or two grains to the ounce of benzole, and, as soon as it has set, place it under the tap and wash for four or five minutes; dry, and the plate is ready for use.

It will be seen that this process is analogous to that which I described in a previous paper, with the substitution of gallic acid for alcoholic solution of aloes.

The gallic acid process gives exceedingly soft and harmonious images. It is very sensitive, greatly more so than the ordinary run of dry processes. The negatives are clean, and the development very manageable. The process is intended either for alkaline or pyrogallie development, of course with a longer exposure in the latter case.

This last gallic acid process has impressed me most favorably. Its power of giving a pleasing rendering of strong contrasts is remarkable. For example: a building partly in sun and partly in shadow is rendered harmoniously, and without a harsh contrast between the lights and shadows. At this time of year, when the foliage is gone, and living myself, at this season, in the city, I have had no opportunity of trying it on trees, but such trials as I have made on objects presenting violent contrasts make me hope to get better effects of foliage by this than by any of the well-known dry processes hitherto in use that I have tried.

The process is, moreover, a very sensitive one. It seems, therefore, proper to remark that if, in consequence of over-exposure, any tendency to flatness is perceived in the alkaline development, it is better to wash off and intensify with acid, pyro, and silver. This can only be rendered necessary by a considerable over-exposure.

PS.—Since the above remarks were in type, on examining some of the self-developing plates prepared in the second manner—that is, with less nitrate of silver—I find that, even after several weeks' standing, they show no disposition to fog.

The conditions of this process are as follows: To obtain the highest sensitiveness a liberal excess of nitrate of silver is necessary; but, of course, its keeping qualities are correspondingly diminished. When there is not too much nitrate, the plates keep several hours before exposure, and appear to keep indefinitely after; for, as the drying goes on, any disposition to fog disappears, and thus the plate, after reaching its full development, shows no tendency to deteriorate, but may be kept until it is found convenient to finish it.

What is invaluable is, that even exposure to light does not seem to affect it after it has become thoroughly dry. Of

course, a plate so exposed could not be redeveloped before fixing, or the fresh latent influence of the exposure would doubtless cause it to fog all over; but in the absence of any such application of a new developer the plate seems scarcely to suffer by light; at least, one accidentally exposed for some time to light was not thereby visibly changed. This is important, because if the process should prove, on thorough trial, to answer well for landscape taking, the ability to keep the plate as long as may be convenient after exposure, without fixing or other treatment whatever, would be very valuable.

TAX THE SUN

Our friend *Punch* has this week made a most diabolical—we beg his pardon, a most brilliant—suggestion. He proposes a tax on photographs! Unfortunately, the idea is not quite new, *Punch* himself having before proposed it. That was in the time of photographic prosperity; but, by some neglect of the Chancellor of the Exchequer, the suggestion was overlooked; and now, in the time of photographic depression, it would never do. In the United States such an impost exists; but it was a war-tax, and our American photographic brethren having been since struggling hard to get rid of it. We wish them success in the struggle for ridance; a struggle English photographers would have to imitate should *Punch's* hint be acted upon. Here is the proposition he makes to the Chancellor of the Exchequer:—

MY DEAR DISRAELI,—You told me the other night, at Lady Derby's party, that you were cutting some pretty figures for exhibition on the Budget night. I should like to help you.

Why, in the name of common sense, and Philistinism, and everything that is practical, don't you clap a penny tax on PHOTOGRAPHS?

I have mentioned it before, but as our friend Bright said last week, it is necessary in England to repeat a thing a great many times before it obtains attention.

There are about five millions of photographs made every year.

Do you know how much five millions of pennies make? Of course you don't, nor do I, nor does either of us know how to calculate it. Thank Fate, we were educated like gentlemen. But there must be some way of finding out, with decimals, or cubes, or hyperbolic loggerheads, or circular arks, or something.

Let us try at the problem. One hundred pence is eight-and-fourpence. I know that—you may take it from me. My little boy got an arithmetic prize (by the way, he will be a big boy one of these days, and then I shall be glad to talk to you about his future, should you be in office), and he assures me, positively, of this. I never knew him to tell a story (excuse a fond parental pride), and we may start upon that hypothesis.

Let us multiply that by ten. Ten times eight-and-fourpence is £4 3s. 4d., and that is a thousand pence. Well, a million is ten hundred thousand. O, bother, we shall never do it so. There must be some shorter way. Let us divide five millions by a penny, that seems simple. One in five—stop, that only brings us where we were before, like the American pig that thought it was getting out of the field through the pipe, only the pipe was crooked, and brought him in again.

Well, details are beneath great minds. I suppose you will allow that five million pence make a very large sum of money, which would look well among your pretty figures?

Get it, then, by enacting that no photograph shall be sold unless it bears an impressed stamp of one penny.

A photograph is surely a luxury. At least, people think it so, though the process of sitting for one is anything else.

Also, no one is obliged to buy one. Therefore, there is no hardship. Also, the Tax is so small that no one who can afford a photograph can feel the addition.

Also, the work of collection will be very easy. Let the Post Offices sell the stamped cards.

It is possible that a few of the touting blackguards who infest the streets, haul in customers, and fight for them, may be discouraged by the tax; but this, instead of being an evil, will be a very good thing. Humble and honest artists will buy their photograph stamps day by day as they do their letter stamps.

And you will, as aforesaid, get a very large sum in aid of your Abyssinian War and your other expenses.

Look to it, my dear Disraeli, and believe me, your affectionate friend,

PUNCH.

P.S. This will be taxing the Sun. He won't mind. He was very much hurt about the Window Tax, which shut out his light; but that is done away and forgotten. I—his moral Representative—answer for him.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC MEETING.

THE usual Monthly Meeting of the Society was held in Myddelton Hall on the evening of Wednesday, February 5th, Mr. W. W. KING in the chair.

The minutes of a former meeting having been read and confirmed, Messrs. Sidney Varden and E. S. Hall were elected members of the Society.

Mr. G. WHARTON SIMPSON read a paper on Glass for Photographic Purposes; and the changes of colour to which it is subject (see p. 75). At the conclusion of the paper he handed round for inspection a piece of sensitive paper which had been exposed under two samples of glass which Mr. Goslett had brought before the December meeting. The two pieces of glass had changed under the action of light from a colourless state, one to a yellow tint, the other to a lavender or purple. The latter, although much the darkest to appearance, transmitted the actinic rays freely, and the paper was nearly as darkly printed under it as where no glass intervened. The yellow tinted sample had obstructed the light considerably.

After some conversation, in which it was explained that Mr. Goslett, who had intended to have brought various samples of glass to illustrate the subject, was unavoidably absent, it was resolved to hear any observations members were prepared to make, and then adjourn the discussion to another meeting.

Mr. DALLMEYER said he had brought a few samples of glass with him, and might not be able to be present at the next meeting. His experience led him to believe that the glass least liable to change was English crown. Some samples of English plate glass were liable to exudation or "sweating." He had, on this account, tried some French glass, made by the St. Gobin Company, which he found free from this tendency. It was also very light in colour, as some examples he produced would illustrate. He believed that Mr. Chance could supply the photographer with a glass which did not change under the action of light. One of the chief causes of such change was, he believed, the presence of oxide of manganese, and also, in some cases, traces of sulphur. In making glass as hard as possible, and using a larger proportion of silica and lime, it was at times apt to devitrify; and to arrest this tendency manganese was used, which tended to cause subsequent change of colour. The important question was: What glass should the photographer use to secure as much as possible immunity from such change? He believed that crown glass was preferable to plate glass in this respect; the latter containing more alkali and being more subject to change. Mr. Chance had made a very fine crown glass, of which he now showed an example. It was much harder than usual samples, the density as compared with ordinary crown, being as 2.488 to 2.555. The price would be higher than usual; but he thought it would be better worth the price than many, as better resisting change. That the colourless glass was most apt to change was illustrated by an exceedingly beautiful sample shown in the Exhibition of 1851; some of which, secured by his late father-in-law, had, without much exposure, changed to a yellow tint, and quite lost its limpidity.

Mr. FOXLEE referred to a studio, in which he had worked some years ago, in which the glass had changed in a few months to an extent which made the exposures much longer. It was a sample made by Chance for studios. Some Belgian sheet, of a pale bluish green, was the best for studios which he knew. He believed that the presence of moisture aided in bringing about the change in some samples of glass.

Mr. BLANCHARD referred to some glass he had examined at the Thames Plate Glass Insurance Company's premises, which had been cut up for printing frames from broken windows. Under the putty it was a bluish green, whilst where it had been exposed to light it was of a decided brown tint, or yellowish green.

Mr. HART referred to some glass of an excellent light blue tint, which he saw at the Thames Plate Glass Works; but was told it was an accidental colour, not one they could rely on producing.

After some further conversation, in which Mr. Dallmeyer, Mr. Foxlee, Mr. Simpson, Mr. Hill, the Chairman (who pointed out the disadvantages of "Cathedral" glass), and some others took part, the discussion was adjourned.

Notice of some intended modifications of rules and nom

tions of officers for election at the annual meeting having been made, after some votes of thanks the proceedings terminated.

LONDON PHOTOGRAPHIC SOCIETY.

THE Annual Meeting of the Society was held at the Architectural Gallery in Conduit Street, on the evening of Tuesday, February 11th. Mr. GLAISHER, Vice-President, occupied the chair.

The minutes of a preceding meeting having been read and confirmed,

The CHAIRMAN said that at the last meeting he had to express his own deep regret, and that of the Society, at the loss of Mr. Claudet. Since then another serious calamity had followed, in the destruction of Mr. Claudet's studio by fire, containing many records and examples of interest, the loss of which was irreparable. Again, also, he had to express his regret at other losses. One of their number, an esteemed member of the Society and of the Council, Mr. Thurston Thompson, had gone. They had also lost Sir David Brewster, a name which could never be mentioned without honour and esteem, whose death caused a loss to science at large. In addressing the members at an annual meeting he regretted that his illness had kept him away for so long a time; but although the Society was, in some respects, as satisfactory as might be desired, it had done much in promoting the art, and would yet do more, and there were many hopeful features connected with it. In its early days, when it was a matter of fashion to patronize photography and belong to the Society, money came in very freely, as might be readily understood when £200 a year was paid to its Secretary. They had for some time past had the same expenses after the support of fashion had ceased, but he now believed that they were in a more promising condition. Now was, he thought, the turning-point in its history, and it would, he believed and hoped, continue to aid and promote the progress of photography. He then proceeded to read the Report of the Council, which we shall publish in our next.

The reception and adoption of the Report having been proposed, seconded, and carried,

The CHAIRMAN said, that as no nomination for officers had been made, except those of the Council at the December meeting, the following gentlemen would be elected or re-elected to office:—Sir Frederick Pollock, as President; the Rev. J. B. Reade, as Vice-President; Mr. W. Morgan Brown, the Earl of Caithness, Mr. John Spiller, Mr. Russell Manners Gordon, as members of Council. In place of Mr. Claudet and Mr. Thurston Thompson, deceased, Mr. Henry Claudet and Mr. Valentine Blanchard were proposed and elected as members of Council.

The Treasurer's and Auditor's report were read, and would be published in the Society's journal.

Mr. Oliver Sarouy, of Scarborough, proposed by Mr. Wharton Simpson, and seconded by Mr. H. P. Robinson, Mr. Glaisher, and Rev. J. B. Reade, was elected a member of the Society.

The CHAIRMAN passed round for examination a portrait of Mr. Durham by M. Adam-Salomon.

Mr. SOLOMON then exhibited his apparatus for enlarging by means of the magnesium light, and, with the assistance of Mr. Allen, produced a very excellent enlargement, which was slightly over-exposed with an exposure of thirty-five seconds; the amount of magnesium ribbon burnt costing, as the Chairman explained, about one halfpenny, as a yard of the ribbon, costing threepence, burnt three minutes.

Mr. J. R. JOHNSON then read a paper on the Treatment of Disordered Baths, in which he detailed the advantage of the use of permanganate of potash in oxidizing and removing organic matter.

After some remarks from the Chairman on the interest of the paper, and on the success of Mr. Solomon's enlarging apparatus,

Mr. DUNMORE read a brief paper on the Advantages of Using a Concentrated Light, and exhibited some specimens characterized by vigorous light and shade, in some respects resembling the effects in portraits by M. Adam-Salomon.

After some conversation, and votes of thanks to Mr. Solomon, Mr. Johnson, and Mr. Dunmore, the proceedings terminated.

Correspondence.

M. SALOMON'S PORTRAITS.

DEAR SIR,—I have read with very great interest the accounts of your visits to the studio of M. Salomon, and it is to be hoped that English photographers will derive great benefit from your lucid explanations of the method of working pursued at the celebrated establishment in Paris.

M. Salomon is undoubtedly an artist in every sense of the word; hence the superiority of the results he obtains. The same description of studio, apparatus, material, &c., can be obtained by most practitioners of photography. Let them use them, and endeavour to take a few lessons from this master of the art. Let us hear no more prating about all sorts of dodges, coloured collodion, and the like. Let us try to approach, if we cannot surpass, the work of M. Salomon. Let us follow, although a Frenchman shows the way.—I am, dear sir, yours very truly,

A. H.

Plymouth, February 10th, 1868.

[We publish this letter because its spirit is one we should be glad to see carried out by all photographers. A spirit of emulation is always productive of excellence.—Ed.]

Talk in the Studio.

A REMARKABLE NATURAL BRINE.—On a recent occasion Dr. J. Attfield exhibited and described a sample of water from Jamaica which had a very unusual constitution. A gallon of the water contained—

Chloride of calcium	...	...	1,500 grains
Chloride of sodium	...	...	1,000 "
Chloride of ammonium	...	...	2½ "

The taste of the water was peculiar, and, upon evaporation, it left a deliquescent residuum, which attracted moisture from the air even faster than the mixture of chlorides of magnesium and sodium ordinarily obtained from sea water. Such a quantity of water would be but ill-fitted for photographic use, and negative films washed with it would be left in a hygrometric condition, easily assailable by the slightest touch of frost. This circumstance might furnish a practical answer to the doctrine lately promulgated.

CHLORIDE OF SILVER BATTERY.—A new construction of voltaic battery, which, considering its small size, gives very great indications of power, was exhibited conjointly by Dr. Warren de la Rue and Dr. Hugo Muller at the meeting of the Chemical Society on the 6th instant. Its novelty consists in the use of chloride of silver fused around a thin silver wire as the negative element, the positive plate being composed of a small rod of zinc which need not be amalgamated. The size of the whole arrangement does not exceed three inches in height, and, with a battery of ten cells excited with salt water, a rapid current of mixed oxygen and hydrogen gases was evolved from acidulated water. When in use the salt brine becomes gradually charged with chloride of zinc, which tends to increase the energy of the battery, and the whole arrangement continues in working order until metallic zinc begins to be deposited on the negative element, when the exciting liquid must be changed. For convenience in putting into action the whole series at once, the round bars of zinc and chloride of silver are fastened at the top to a wooden frame which is made to slide upon glass uprights, and, when immersed, the white chloride is, of course, undergoing a slow reduction to metallic silver, which permeates the mass much after the fashion of the strings of virgin silver that are not unfrequently met with in nature, and are believed to have a similar galvanic origin. Messrs. De la Rue and Muller are having made for further trial a battery of two hundred cells.

PORTRAIT FIGURES WITH NATURAL BACKGROUNDS.—Our notice of Mr. Edge's cards has elicited many ingenious suggestions on the subject of double printing. Referring to the subject generally, the Editor of the *Scientific American* says:—"We have seen equestrian photographs beautifully done in this way.

The photographer arranges in his studio a wooden rail of the right height, on which a side saddle is placed, and the lady, dressed in equestrian costume, mounts, takes position as in riding, and is duly photographed. A paper print of this negative is then made, out of which her figure is carefully cut, blacked, and pasted upon the engraving of any handsome steed that the lady chooses to select. A negative of the horse is then made which has a blank space corresponding to the figure of the lady. Two printings are required to produce the picture: one from the negative of the lady, the other from that of the horse. Instead of engravings, photographs from living animals may be used.

COST OF DISTILLED WATER.—A sensational statement recently appeared in the *Pall Mall Gazette*, to the effect that the distilled water used by the Abyssinian Expedition cost two shillings per gallon, and amounted to £4,000 per day. A naval officer writes to point out its exaggeration, and says:—"In our ships of war, even under unfavourable circumstances, one ton of coal may be depended upon to produce at least ten tons of distilled water. With coal at £1 a ton the price of distilled water would be two shillings per ton. Probably at Zoulla Bay each ton of coals may cost £3, at which rate a ton of water would cost six shillings, making the price per gallon more nearly a farthing than a halfpenny."

To Correspondents.

MERCURY.—The operation of transferring the image to a lithographic stone after you have produced the image in bichromated gelatine and covered it with ink is a simple one; but as it requires manipular skill, it is generally effected by a professional lithographer. The image, having been produced ready for transfer, is placed on the prepared stone, and then run through the press, the ink leaving the gelatine and attaching itself to the stone. The stones, &c., can be obtained of various dealers in such materials.

W. W. (Newcastle-on-Tyne).—Your canopy A should be placed at a right angle with the background, and you will not then need the extension B. Your lens is not apparently a good one; and, in any case, it is too short in focus for standing figures in card pictures. If you study the articles on *Pictorial Effect* which we are now publishing from week to week you will improve in posing.

D. S.—Any good lens, or quarter-plate lens, will serve for enlarging in the method we described of camera printing on collodion. Regarding landscape photography, it is difficult to recommend any especial course. A few men succeed perfectly with dry plates, but more succeed with the wet; and unless you are quite certain of your process and manipulations with dry plates, it is safer to use the wet process, as in that case you see the result at once, and if one plate fail you proceed to try another. It is equally impossible to say which is the best kind of tent, lens, &c., as so much depends on the kind of work you wish to attempt. Consult our advertising pages, and if you wish for information on any special point, state the details clearly, and we will advise you.

B. R. S.—You are right. The paragraph relating to the use of carbolic acid for mounting materials, accredited to the *English Mechanic*, is an extract from one of our own articles, made without acknowledgment.

ANTI-CHIGNON.—The chignon head-dress is doubtless rather troublesome to the operator; but with a head-rest, which can be adapted to different positions and different forms of head, it is generally possible to place the rest so as to form a support to the lower part of the head, just underneath the chignon. The card you enclose is exceedingly good, but just a little too deeply printed.

SICK BATH.—It is probable that you have made the bath too strong, and have not added sufficient nitric acid. It does not require iodide of potassium. There is no mode in which you can readily ascertain the purity of your distilled water without trying it. The salt of alumina used by Mr. Bird for purifying water is ter-sulphate of alumina; it can doubtless be obtained of any manufacturing chemist. You will find details on page 440 of our Tenth Volume.

W. J. A. G.—If we had been using tinfoil for a mask, we should certainly have lined it with paper, as, on bringing a metallic substance almost in contact with free nitrate of silver on the paper, we should expect decomposition and stains. 2. The stains on print No. 2 may arise from many causes. It may be that the bath is out of order, it may be dirty plates, or other causes; but the mere sight of a print is not a sufficient guide to

enable us to say what is the cause. 3. There is no absolute rule for the distance of the figure from the background: about two or three feet will answer. 4. If you attempt to intensify by means of your iron developer, with a few drops of silver added, the developer must be one containing sufficient of a restraining agent, either acid, gelatine, or suitable material to permit such addition of silver without decomposition. 5. The deep colour of collodion is due to free iodine, either added or liberated from the iodide. 6. Collodio-bromide of silver, if properly made, ought to have an opaline appearance, and be free from the granulation you describe when poured on a plate. The sensitive preparation will keep for a time; but is better tolerably freshly mixed. The *Philadelphia Photographer* can be obtained of Trubner, Paternoster Row.

J. W.—Very good for a first attempt; but there has been a trace of foggy deposit on the negative, we fancy. If you had painted the back of the plate, or used wet red blotting-paper in contact with it, you would have avoided the spreading of light by reflection where the window is.

W. FISHER.—It is impossible to say which position the sitter should face without having the design of the studio before us, as so much depends on the direction from which the best light is obtained; but speaking in the abstract, without relation to circumstances, which may modify the matter, facing the north-east is better than facing the south-west.

J. H. T.—On the whole, the subject is well chosen; and composes well. As a picture, it would be ruined without the chapel; it is also improved by the hedge, although, had it been quite under control, a little less of the hedge would have been better, as the interest it possesses scarcely justifies the space it occupies and the prominence it receives. The chief fault in the picture is that the middle distance and distance have little, if any, difference in their rendering, all after the immediate foreground being of one tint. 2. The best plan, in the case you describe, is to clean off the varnish with spirit, and begin again.

R. S.—A variety of causes may tend to produce the sunken effect and lack of surface vigour in a developed print, and also the want of purity in the whites. The paper itself, and the mode of preparing it, materially affect the result. An English paper, with hard size, gives the most vigorous picture. If an ordinary photographic paper be employed, a little gelatine in the salting solution is often of service. The use of iodides without chlorides tends to produce pictures lacking surface, vigour, and cleanness. Of course the paper has two sides, and if you float the paper on the silver bath with the side in contact which was not in contact with the salting bath, the image is sure to be buried. The presence of any diffused light in the dark room is a frequent cause of lack of purity in the whites. There is no appearance of under-exposure in the print you send, but the negative is apparently a little too vigorous for such work. Development printing always requires a little experience and judgment to succeed with any degree of satisfaction, and the prints rarely equal in brilliancy those direct from negatives. As a rule, they require retouching to produce the best results.

X. Y. Z.—That marked A will answer your purpose best, and will serve both for copying and architecture. It will give straight lines, and is more rapid than the other you name. One the focal length of which equals the base-line of the size of picture required will suit you.

GLASSHOUSE.—In the position you describe, either a ridge-roof, with side and skylight facing north, or a lean-to building, with similar lighting, will answer; but decidedly avoid the slant fronting light to which you refer, which is much more inconvenient to manage. 2. Decidedly No. 1 of those you name.

HYPO.—A facetious correspondent asks us what articles, besides photographic prints, are best when entirely freed from hypo. We presume critical articles: few people like anything hypocritical.

Mr. Bovey's first article on Silver Printing, and several other articles in type, are unavoidably left over.

Several Correspondents in our next.

Photographs Registered.

Mr. D. RICHARDSON, Darlington.

Photograph of the First Locomotive.

Miss E. PECHAY, Bath.

Photograph of Frontispiece for Album.

Mr. E. B. JULIAN,

Photograph of Farmers' Hall, Evesham.

Messrs. W. W. and C. LAW, Northampton.

Photograph of Lions round Nelson Column.

Mr. J. BATEMAN, Canterbury.

Photograph of Interior of Miss Hales' Chapel, Hacking on.

Photograph of the Crib in ditto.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

Permanganate of Potash for Rectifying Old Baths.....	PAGE 85
Mr. McLachlan's Discovery.....	85
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	86
Or. Natural Clouds and Atmospheric Effects in Landscape Photography. By Nelson K. Cherrill	87
Pictorial Effect in Photography. By H. P. Robinson.....	88
Visits to Noteworthy Studios	90

Omnium Gatherum: Remarks on Various Photographic Topics. By Samuel Fry	PAGE 92
A Suggestion for a New Mode of Treating an Old Negative Bath By J. R. Johnson	93
Annual Report of the Council of the Photographic Society	94
Proceedings of Societies—The South London Photographic Society	95
Talk in the Studio	96
To Correspondents.....	96

PERMANGANATE OF POTASH FOR RECTIFYING OLD BATHS.

At the recent meeting of the Photographic Society Mr. J. R. Johnson read some interesting notes of an experiment with permanganate of potash, used for the purpose of removing organic matter in an old negative bath. The value of this permanganate for purifying water containing traces of organic matter has been for some time well known; and the experiments of Mr. Crookes, described in our pages twelve months ago, in which the value of permanganate of silver as a means of purifying water for photographic purposes was demonstrated, called the attention of photographers more especially to the subject. As this salt was not, however, commonly found in commerce, it did not come into general photographic use.

Mr. Johnson takes the well-known salt, permanganate of potash, which Mr. Condy has made familiar as a water purifier, and adds it to the disordered bath, and, so far as his experiments have gone, with the completest success. When permanganate of potash is added to water containing organic matter, all the constituents of such matter are changed by the oxidizing action of the permanganic acid; the hydrogen is converted into water, the carbon into carbonic acid, and any trace of nitrogen into nitric acid. The permanganic acid, robbed of oxygen and reduced to sesquioxide of manganese, is precipitated as a brown powder. The potash which was combined with the permanganic acid is liberated in a caustic state, and combines with any carbonic acid or nitric acid which may have been formed. When permanganate of potash is added to a nitrate bath it is probable that similar reactions will follow; and as the common organic accumulation in an old bath is alcohol, and the reaction between permanganic acid and alcohol is very rapid and complete, a ready means of removing this accumulation from the bath is here furnished.

The operation is analogous to the common method of removing organic matter by sunning, and furnishes a rapid mode of effecting the same thing without waiting for sunlight. In sunning a bath, which is, of course, first neutralized or made alkaline, the oxide of silver under the action of light gives up its oxygen to the organic matter, producing a similar result, slowly, to that produced by permanganic acid at once.

The chief risk attending this process is the production of alkalinity from the carbonate of potash formed in the course of the reactions. This is, however, a point easily ascertained and remedied. If excess of permanganate be added, it would result in the formation of permanganate of silver, which would be precipitated and filtered out, merely weakening the bath a little, and leaving nitrate of potash in solution.

Pure permanganate of potash is readily procurable in

commerce, in well-defined needle-shaped crystals of dark purple colour. It is sometimes sold in the form of a greyish powder: this is generally very impure. It is soluble in sixteen parts of water, but is generally used in a 20-grain solution, which is of a red purple colour. When added to water containing organic matter it rapidly loses its colour; it should be added a little at a time until a faint pink tint remains for some time, the permanence of this colouration indicating that the necessary reactions are completed, and all the organic matter oxidized.

Permanganates are somewhat sensitive to light; but no special photographic use has hitherto been made of them. It is possible that, in the final washing water, they might be found valuable in oxidizing final traces of hyposulphites, and converting them into harmless sulphates.

MR. McLACHLAN'S DISCOVERY.

We have recently had an opportunity of conversing at some length with Mr. McLachlan regarding his alleged discovery, and ascertained some particulars regarding it. His great aim has been to discover the rationale of the collodion process, and to ascertain not merely that certain results were the usual sequences of certain acts, but why they followed, and what were the causes in operation, so that a failure once incurred, its source being known, it might be effectually avoided in future; and a success once obtained, its causes being thoroughly understood, it might be certainly and unerringly obtained for any number of times afterwards. In short, he has endeavoured to rise from the rule-of-thumb operations which he believes to prevail in photography, into practice based on principle.

He believes that he has succeeded in this, and has, for the last two years, been putting a discovery then made to the test. He believes that he can succeed steadily and certainly in all the operations of producing a negative, keeping his preparations for any length of time, and for any number of plates, in absolutely certain working condition. This success he states to be based on principle; but although certain formulæ are most conducive to success, yet absolute success depends on the use of "brains": judgment in the application of the principle and the use of the formulæ is necessary. How far this fact may place a limit on the value of the discovery we leave readers to determine for themselves.

In making his appeal through the journals for investigation, he was desirous of making sure of certain things. He wanted examination from capable persons free from the possibility of prejudice; he was conscious that he incurred risk of the suspicion of some and the ridicule of others; but he was willing to submit to this for what he believed to be the good of the photographic community. He was willing

to forego all pecuniary reward for disclosing his secret, notwithstanding many offers of purchase; but he was anxious that whatever credit might be due to the discovery might be fairly accorded to him.

This was natural; but, after all, it led to a somewhat false position. An appeal was made for competent examiners; but they must be free from the possibility of prejudice or prepossession, or of risk of unconsciously using Mr. McLachlan's ideas. One gentleman whom we know to be perhaps of all men in England the best fitted for the task—his qualifications as a man of science, as a scholar, as a non-professional photographer, and as a gentleman of high social position, being beyond challenge—was judged unsuitable because he was supposed to be a contributor to some of the journals, and might be committed to certain views on the one hand; or might, on the other, although pledged to confidence, find it impossible to write without making use of the ideas communicated by Mr. McLachlan. We pointed out that the gentleman in question was in nowise connected with any journal, but when he had a suggestion to make to photographers necessarily made it through one of the recognized channels of information, and that the highest scientific authorities, such as Sir John Herschel, would be open to a similar objection. This Mr. McLachlan saw, and admitted his position to be untenable, and that his views of a court of appeal must be modified. We mention the circumstance to illustrate the difficulties arising out of the position he has felt it desirable to assume.

Acting under modified views, Mr. McLachlan accepted a suggestion made at a social gathering of photographers. On Wednesday, the 12th, he had an interview with two gentlemen in London, Mr. Spiller and Mr. Peter Le Neve Foster, for the purpose of explaining to them, in confidence, the principles upon which his discovery was based. After some experiment these gentlemen will report as to results. What the next step in the matter may be, or when the public will be made recipients of Mr. McLachlan's confidence, remains yet to be determined.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

PREFATORY REMARKS.

"CAN anything new be written on the subject of printing and toning?" is a query that suggests itself most intrusively as I resume my pen to enter once more on a well-worn topic, which a truly formidable array of hints, formulæ, and minute directions would seem to have rendered completely threadbare, so far as teachings by the pen-and-ink process are concerned. But a heavy file of letters before me at this moment afford incontrovertible proofs that photographers have received instructions from indifferently qualified teachers, or they themselves belong to the numerous race of dullards. From north, east, south, and west have those silent messengers (now together impaled) come to inquire somewhat concerning printing matters: "The best formulæ for a sensitising bath?" "How long the time of floating requisite?" "Why the toning solution works so tardily?" "The reason why the toning bath has taken a fit of silks or laziness, and won't tone at all?" "The cause of small, yellow spots appearing in the prints after fixing, required?" "How to prevent bleaching?" "How to get the richest of prints" from the poorest among negatives? "How to secure black, blue, brown, warm purple, cold grey," and heaven knows how many other tones? And ten thousand laments seem to be concentrated in one general cry—"Oh, for a really reliable and uniform paper! Can you help us?" These, with many other questions of a similar character, afford ample proof that photographers have still much to learn, and need further assistance to enable them to overcome their printing difficulties; therefore, in the absence of a better qualified preceptor, I have, after much hesitation and contending cogitations over the matter, consented to brave malicious

commentators (if such there be), by writing a progressive series of papers, which will describe the *modus operandi* and the reason why of every move, in language sufficiently plain to enable all concerned, by moderate study, to rid them of their printing failings and failures.

A cursory glance over the matter would cause it to appear somewhat incomprehensible that, after so many years of active, practical experience in printing and toning operations, widespread ignorance, both of practice and theory, continues to cling, like a noxious parasite, to the art of photography. But to myself, who, in the capacity of a "journeyman printer" of no inconsiderable experience, have worked behind the scenes, the problem is one that works out its own solution. Professors of the "light art" (gentlemen operators), as a rule, entertain a decided contempt for "mere printers," whose usual workshops are mouldy attics, sloppy washhouses, deserted out-buildings, and grimy coal-cellars (remember, I have the authority of personal experience to bear me out in my statements). Somewhat *a la mode Calcraft*, with head nearly touching the horizontal "rafters," and body, to the waist, protruding through a trap door, I have stood on a ladder sensitizing paper. I have toned prints in a crazy, tumble-down shed, where my intrusive movements were suspiciously watched by the winking eyes of half-a-dozen sleepy barn fowls. More recently I superintended the printing department of a leading west-end house; said department being conducted in an unstalled stable. When occupied in the work of printing I have been sent to the roof above, and consigned to a foul court beneath. Ofttimes at a window have I stood, far above the pavement, and have clutched convulsively at the quivering printing-frames, as each wild blast threatened to wrest them from my grasp; and I have breathed a silent wish that some good spirit would stand beneath and shout into the ears of unsuspecting passers-by, "For your head's sake, stand from under!" Aye, and when I have successfully grappled with difficulties more important than any above enumerated, I have smiled as the half-sneering sentence flitted through my mind, "Only a printer!" "Only a printer!" yet what an amount of diligent observation and intelligent study needed to enable that printer to understand the nature of his work, and unfaithfully to cope with its manifold difficulties; and the chief reason why so few competent hands undertake to qualify themselves for printers is because of the sorry reward that would await them. Except buoyed up by making his business a labour of love, the life of "only a printer" is cheerless indeed. No medals nor honours of any kind to awaken slumbering ambition. No word of commendation falls to his share when prizes are awarded, for his—beg pardon, all his employer's—work. He is placed on a level with an organ bellows blower—the operation creates the harmonies. What matter whether that broad shadow that breaks up the foreground of yon brilliant landscape picture is the result of judicious sunning? What matter if the transparent tints in the winding river are produced by like means? the negative is the be-all and end-all. Why allow a thought to descend as low as the "machine-like printer?" And photographers really expect competency to be obtained under such adverse conditions. Echo cries, Don't they wish they may get it? "My printer is so ignorant of his work!" exclaims the employer. "My printer" might, in most instances, consistently reply, so far as printing is concerned, Ditto. I have conversed on the subject with photographers of high, medium, and low standing, and I have no hesitation in stating that, with very few exceptions, they know next to nothing about it, and their failures are accounted for in two short sentences, "My ignorant printer;" "Tis that abominable paper."

This last quotation written by my pen might, perhaps, to some savour strongly of "shop." To such I would reply in all sincerity, "*Hon! soit qui mal y pense.*" I disputed the sweeping condemnations levied on paper long before I ever dreamed of becoming myself a dealer in the article, and I do not hesitate once again to reiterate, the paper is less at

fault than he who fails with it. There is not a respectable dealer in photographic papers who does not supply an article capable of yielding the best results if intelligently treated; and from my personal knowledge of several photographic paper manufacturers, I venture to affirm that to a man they are most pains-taking, and do their utmost to supply their customers with the best possible material. The fact of the matter is just that, as a rule, it is not the paper produces failures, it is ignorance of principles; want of that chemical knowledge which enables the manipulator to command uniform success; 'tis a slavish observance of formulæ; above all, 'tis the characteristic proueness of man to quarrel with his tools when his work turns out a failure. When I started as a printer some years ago, I began with a determination that on all occasions when failures occurred I would first attribute the cause to self-ignorance, the chemicals and paper when thoroughly convinced either was in the wrong; and it is with feelings of pride I record it, after years of anxious toil, laborious study, and extensive experimental research, the wisdom of my first determination has at length become evident; for what were once my masters and tormentors have now been reduced to the subordinate positions of servants, and my chief desire is to communicate my experience in a form that will enable readers of the most moderate capacity to conquer, even as by hard up-hill work I have conquered. Possibly the victory has won even late in the day; possibly silver printing may be on its last legs; I doubt it much, as the best that can be said of any other method is, "it is equal to a silver print." For general purposes I have no hesitation in declaring that no process yet discovered can in usefulness approach silver printing. The question of permanency is doubtless its weakest point, but I am inclined to think the evil has been greatly exaggerated. True, prints have been dipped in sulphurous compounds, and have, by such means, been deprived of their fair complexions; but folks are not in the habit of applying such a straining test to their pictures; they neither boil them, bake them, fume them, nor expose them to anything more injurious than the atmosphere they themselves breathe. "They turn yellowish, greenish, everything uglyish notwithstanding," methinks I hear the reader reply. Granted in some cases; but I feel bound to offer a good word for the much-abused silver process of printing. About twelve months ago I caused a number of prints to be pasted on the interior walls of a laundry. No preservative nor extra precaution of any kind having been taken, the prints referred to have for nearly one year been exposed to extremes of temperature; at short intervals to the reeking steam proceeding from dripping linen, and for many hours each week to the fumes arising from burning coke. At the present moment, apart from a faint coating of dust, no change is perceptible. The probable reason why silver prints so often deteriorate quickly will be shown in its proper place.

In conclusion, having in these my prefatory remarks unburdened my conscience, my next will commence the subject at its beginning, by treating on the papers and materials employed to render them serviceable to photography. And my readers must admit my honest intentions when I prove to them how absurd is that parrot-like exclamation, "O, that trash of paper!"

ON NATURAL CLOUDS AND ATMOSPHERIC EFFECTS IN LANDSCAPE PHOTOGRAPHY.

BY NELSON K. CHERRILL.

THE importance which attaches itself to the discussion of any point of photographic manipulation is usually in direct relation to the difficulties involved in such manipulation, and to the amount of skill on the part of the operator necessary to overcome them.

This remark will, I think, be found to apply with much force to the subject before us. That clouds are important to the picture, no one will for a moment deny; that they are but seldom seen, as a rule, in photographs, is manifest;

while it is, in my opinion, equally evident that this lack of cloud effects in the general run of photographs arises almost entirely, if not solely, from the difficulties which beset the photographer when he attempts to produce upon his sensitive plate the image of their quickly changing forms.

Hence, I think, the importance of discussing at length the various means by which clouds and cloud effects can be best obtained in landscape work.

Before I enter at length into the question of considering the various means whereby I have obtained successful results in taking clouds, &c., upon the same negative with the other parts of the landscape, I wish to enter a little into the question as to whether it is or is not necessary for the production of the best results in a pictorial and artistic point of view that the clouds be obtained on the same plate and at the same moment with the rest of the picture. To this I give as my unalterable opinion, that it is quite possible in many cases to obtain results as good, or better, with separate skies, than can be obtained with the natural skies which happened to exist at the moment of taking the picture; though, at the same time, there may be many cases in which it is not only desirable, but necessary, to take the clouds and all at one operation. Of course, when a picture is taken with a white sky, and clouds put in from another negative, the result must depend in great measure upon the art knowledge of the photographer, as well as upon his skill in effecting the mechanical part of the arrangement. The clouds used in such cases must be in proper harmony with the picture, and must not in any way disturb its balance of light and shade; also, they should be of as nearly as possible the same character as those which existed in the view when the other parts were secured. For instance, it would be very improper to represent huge masses of cumulus clouds in the sky of a picture taken under the serene and still aspect of a summer's early morning; not that it is impossible that such clouds might have existed in the sky at the time, but the effect of the picture would be inevitably spoiled by them; inasmuch so, that even if they were actually present in the sky, it is easily to be imagined that no artist would attempt the landscape till they had cleared away, and certainly no photographer wishing to represent the beauties of early morning would print in such clouds as those of which I have been speaking; he would rather have no clouds than the wrong ones. And it is only his art knowledge which can dictate which are the right and which the wrong ones. If there is, however, choice in the selection of clouds for any picture which has been done with a white sky, there is equally a choice in the selection of clouds for any picture which it is proposed to render all at once—sky and foreground at one operation—for it cannot be supposed that all skies are equally suited to any view, and it is hardly to be supposed that the sky and the view will remain for long exactly suited to each other. I know that there are cases—but these are, I think, more the exception than the rule—when for a whole day the clouds follow one another over some glorious landscape, each form, as it passes, seeming more splendid than all that preceded it, and each arrangement of effect seeming better suited to bring out the force and effect of the view. Then, of course, your photographer without art knowledge has nothing to do but to work away as hard as he can, and to obtain the most perfect results which his skill can command; but this is not always so. It is not always—I believe I am right in saying it is not often in this climate—that the clouds are at any particular time when it becomes more or less necessary to take the even sufficiently suitable to render it worth while to change about them one way or the other. When, however, as a sort of are constantly changing, in some aspects they are pictorially right, and in others, if not absolutely so, are far indifferent as to spoil the effect of the picture; and if the arrangement of these things and to judge them requires a glance, if that which nothing but art knowledge can strike the eye at once, rely

his choice of a sky, whether it be that he wants to take his pictures all at one operation, or whether he take them at two. No mechanical addition to the camera, no flapping of shutters nor crowing over other people's work, can compensate for the want of a calm, decided judgment, based upon a complete and thorough knowledge of art.

I mentioned, in the beginning of this paper, that though in many cases clouds might be printed in afterwards so as to produce as good an effect as if they had been taken in the original negative, there were also many cases in which it was necessary to take them at the same time with the rest of the picture.

I consider that these cases may be made out briefly as follows:—Whenever the sky-line of the picture is tolerably near and abrupt—as, for instance, in nine-tenths of the English landscape scenery, where the objects in the foreground or middle distance rise up to the sky-line, or where the hills or other distance may not be more than (say) a couple of miles distant—the line of demarcation is quite sufficiently well made out to enable a skilful operator to put in any suitable sky in such a manner that no one could tell whether it were joined or not. In all such cases I look upon it as optional to the photographer to produce the sky at the same time with the rest of the picture, or to leave it for a subsequent operation: his art knowledge being, of course, the guide to direct him as to which plan it will be best to adopt.

But, on the other hand, where the view is of a very extended character, and the distance of the horizon very great, the clouds become so mixed up, as it were, with the picture, that no double printing could serve to produce the best effects in an artistic point of view. No clouds but those which actually went to form the picture at the moment the lens was uncovered can be put in to do duty for the innumerable delicate gradations which they produce upon the forms of the distant view; not only by their shadows (for I look upon these as a matter of comparatively minor importance), but also by their being actually mixed up with the view, as I said before. The reason of this is evident: the clouds are suspended in the atmosphere at a very limited height from the earth—I do not know what exactly, but say, for argument, from 1,000 to 3,000 feet.* Let us take the lower figure, as it will serve to illustrate my point the best, and the principle will hold good in all cases.

Let us, then, speak of clouds 1,000 feet from the earth. It will be evident, on a little consideration, that in a near view, the clouds and the landscape will be two different things suited to each other, it may be, but separate and distinct; the clouds will, as it were, be something held up behind the picture, something which may be altered without changing anything else in the picture. Now see how different the case will be with *very* distant views. There are many views in this country where the most distant point in the horizon is, perhaps, twenty, thirty, forty, or even fifty miles off. Now suppose that between the spectator and the farthest point of the horizon in such a long view as this there are clouds at various intervals at a height of about 1,000 feet. It will, I think, be seen at once how, by the natural law of perspective, they seem to come nearer and nearer to the earth as the distance increases towards the horizon; so that mountains, and even quite small hills, are apparently shrouded and veiled by them, when in reality they may not be so. Now this is just the effect which must be produced at *once* in the camera, or let alone; no amount of double printing can effect it, nor can any amount of dodging secure the representation of the true effect in any other way than by *concentric* photography. So, then, I conclude, that while in any and uniforn, which the clouds are *behind* the picture sought to be other question printing may and will suffice for the best photographers is necessary to produce the picture all at

assistance to enable the weather clouds, and not of rain clouds, ceptor, I have, after n consequently interfere with the view at a cogitations over the matter; tator.

one operation, when the clouds come in front of any part of it, or when they are in any way mixed up with it.

These remarks do not apply to what is usually known under the name of "atmospheric effect." I have been speaking of clouds as clouds, and not as mist, fog, or vapour. We all know that when clouds descend to the earth they look very different from what they did when high up in the air; and when clouds come down so as to form a palpable mist or rain upon the earth, the view is generally very much confined, seldom extending beyond a few miles. Also, under these circumstances, the clouds have but few grand effects suitable to the pencil of the artist or to the camera of the photographer. Storm-clouds, before or after rain, are almost always grand enough; but during the storm itself most men would prefer shelter to work. When the distance is, however, only involved in slight mist; when it looks atmospheric (or, as a friend of mine would call it, "mysterious"), and when it is not too distant—no "cloud forms" actually interfering with the outlines of the distance—sky can be put in by double printing; but it must always be borne in mind that the more distant the view the more difficult it will be to put in clouds with good effect by double printing, because they must be so very delicate, and the line of junction must be so exceedingly well managed not to show.

I had intended to finish up this first part of my paper by a few remarks upon cloud shadows, but I shall refrain from the subject, as Mr. Simpson's remark at a recent South London meeting so completely answers any objection which might be raised to the double printing for clouds, on account of the shadows being wrong. I would only add the further consideration that it is, as a rule, impossible to point out in any picture which shadow is made by any given cloud, and that, therefore, though it may not be strictly true to put one set of clouds and another set of shadows, if no one can detect the error who is to say where it exists? I would not for one moment, however, uphold any error in photographic works; I would much rather they were all done with absolute truth as well as with the best artistic effect; but I hold, and I think I shall carry the sense of the best men in the profession with me, that in such a case as I am now speaking of, a *slight error* in the representation of the cloud effect is better than a great departure from the requirements of art. I am of opinion that where one or other must be the case, it is better to have the shadows of the clouds in the picture too small (or, rather, too large), or slightly in the wrong place, than to have an arrangement of clouds which would be utterly inartistic and unsuitable to the character of the picture. In every case, as I have before said, there is no rule, but the simple capacity of the artist must serve to direct him in this as in all other matters of choice.

In my next I hope to set forth some of the means by which I have been enabled most successfully to render clouds in the same negative as the landscape; and in a future paper I shall hope to give some more suggestions as to double printing, with especial reference to the subject now under consideration.

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS. BY H. P. ROBINSON. CHAPTER IV.

"It is quite singular how very little contrast will sometimes serve to make an entire group of forms interesting, which would otherwise have been valueless."—*Ruskin*.

"The arts themselves, as well as their varieties, are closely related to each other, and have a tendency to unite, and even lose themselves in each other; but herein lies the duty, the merit, the dignity of the true artist, that he knows how to separate that department in which he labours from the others, and, so far as may be, isolates it."—*Goethe*.

"Sounds which address the ear are lost and die
In one short hour; but that which strikes the eye
Lives long upon the mind; the faithful sight
Engraves the image with a beam of light."—*Dr. Watts*.

"BECAUSE things seen are mightier than things heard," to quote Teunyson, and because an actual example visible to

the eye is better than pages of written words, I propose in this chapter to give a slight illustration how an artist, even in such a trivial sketch as the subject engraved on this page, conforms to the usages of art, and the value which his work gains by such treatment. I take this subject because it follows and illustrates the rule of balance given in the last chapter.

The two engravings represent the same subject—Windsor Castle—and are identical, with the exception that the sharp spots of black—the boat in the river and the bit of bank and tree—which appear in the one are removed in the other. It will be observed that the diagonal line starting in the

of dark in the foreground that this is the only possible form in which a landscape should compose. The principle may be applied in exactly the opposite manner: light may take the place of shade, and perform the same function. The picture may be generally dark, with a mass of light in the foreground by way of balance. For instance, the picture of a dark, gloomy castle may be relieved by a flood of light in the immediate foreground, breaking up and enlivening the otherwise monotonous shadows. Neither is it absolutely necessary that the landscape should rigidly follow the diagonal line; there are endless variations of the principle; but I give this, the plainest and most obvious of

all the rules of composition, first, because it is a key which, once mastered, will enable the student to unlock the secrets of the most complicated designs, and render his future studies easy.

As I proceed with my subject, I foresee that a little difficulty may possibly arise. The chief danger I appear to incur in writing definitely is that of being mistaken when I describe all pictures as composed in regular shapes such as the diagonal, pyramidal, circular, and similar forms; but it is only by this means that I am able to put anything tangible before the student, who, when he is sufficiently acquainted with formulae, and knows how to classify and combine them, may experiment with originality of composition upon his own account. As I said at the outset, rules are not intended as a set of fetters to cripple those who use them, and it is not intended that the student should absolutely abide by them. The object is to train his mind so that he may select with ease, and when he does select, know why one aspect of a subject is better than another. To some readers it may appear superfluous to thus look upon nature as a thing to be arranged

before any satisfaction can be derived from its contemplation, or from its representation; but when the student begins to analyse the cause of the beautiful and pleasing effect of some pictures, and the disagreeable effect of others, equally perfect as far as finish and manipulation is concerned, he will find that he can assign the reason to some agreement with the rules of art, however remote.

An attention to rules will assist the artist in keeping his picture in tune. The small mass of dark or light, whichever it may be, in the near parts of a landscape acts as a sort of keynote, as I have already said, and the pleasure good composition gives to the educated eye is not unlike that the ear derives from perfect harmonies in music; and if the arrangement of a picture is not obvious at a glance, if that which is equivalent to *melody* does not strike the eye at once, rely



Fig. 1.



Fig. 2.

and in his pictures, the point of dark, being placed near to and opposed to the point of greatest illumination, gives extreme value to his highest lights. The same method is almost invariably found in the landscapes of the Dutch school. In Turner's magnificent pictures of sea and sky the wonderful luminosity is, in a great measure, due to the darkest black being opposed to the highest light.

It is not necessary that the point of dark should consist of one object only; it is sometimes convenient to introduce a group of figures or a mass of rock; but it must always be remembered that a judiciously placed mass of dark in the foreground not only gives balance to the composition, but also increases the effect of the gradations of the middle and extreme distance.

It must not be supposed because I have spoken of a point

upon it that if the picture is pleasing, the composition is there, although it may be in a minor key. As music is only sound under governance of certain laws, so is pictorial effect only the combination of certain forms and lights and shadows, in like manner harmoniously brought together.

The moral to the landscape photographer is, that in many cases he must endeavour to obtain in his foreground some object or mass of objects that will act as a keynote to keep the whole in harmony; and if nature does not supply such object, the pictorial requirement may often, without violating material truth, be furnished by art. On this point more in another chapter.

VISITS TO NOTEWORTHY STUDIOS.

MR. T. R. WILLIAMS' STUDIO.

WE invite our readers next to visit with us an English studio, where the work produced has long been with English photographers a favourite type of all that is at once delicate and perfect in modelling in photographic portraiture. None have ever surpassed, few have ever equalled, Mr. T. R. Williams in the exquisite delicacy, without feebleness or flatness, and the fastidious freedom from blemish which characterizes all his work.

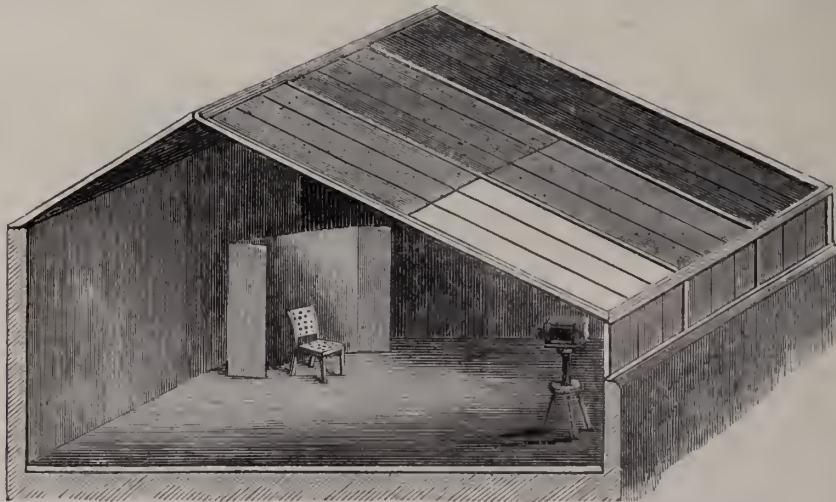
We well remember a time—some ten or twelve years ago—which will be familiar to the memory of many London photographers, especially portraitists, when traditions of secret dodges were rife as the explanation of qualities at that time much rarer in photographic portraiture than now, a secret printing process was a favourite explanation, all the paper being, it was alleged, prepared by Mr. Williams' own hands, no assistant ever being permitted to penetrate the mystery; at a later period retouching was the favourite explanation; and we find, about four years ago, just after Mr. Williams had received a medal for portraiture at an exhibition of the Photographic Society, a published letter in which a correspondent asks if it be true that the "beautiful modelling and fleshy texture are due to the skilful artist rather than the photographer; and that use of wax or encaustic paste conceals all trace of colour, and even permits the picture to be sponged without detecting the presence

of the neutral tint employed?" It was true that Mr. Williams had pasted on the back of the frame duplicates of each picture exhibited, which permitted the opportunity of examination without an intervening glass; but this did not prevent the prevalence of the rumour in question, nor the statement in some quarters, not only that the pictures were touched, but the water-colour artist who had touched them admitted the fact. We have been forcibly reminded of these incidents recently, and also of how singularly history repeats itself.

Mr. Williams is one of the oldest as well as one of the most successful professional photographers, and one of the very few who commenced life with photographic portraiture as a profession upwards of a quarter of century ago. Having passed a few years in M. Claudet's studio, Mr. Williams subsequently initiated the practice of producing artistic groups for the stereoscope, and few things produced in photography have surpassed in beauty the charming Daguerreotype studies then produced, and which were eagerly bought by the public at a guinea each slide. Devoting himself at a later date solely to portraiture, his Daguerreotypes soon became famous for very similar qualities to those which now pre-eminently distinguish his paper pictures,—a singular brightness, and combination of the highest delicacy with great force and modelling.

Before entering the studio we may mention one or two instructive circumstances. Mr. Williams has never placed any pictures at his door, or, so far as we believe, made any kind of public announcement inviting patronage; but he has, nevertheless, always been one of the most fully employed portraitists in London, at the highest rates commanded by photographic portraiture. We mention this to enforce the lesson that excellence, not cheapness, is the true source of business success. Notwithstanding the race for cheapness which has been going on for years, Mr. Williams receives now, as he has always done, for six card portraits one guinea, and for six card vignettes one guinea and a half; a price at which the excellence of the work commands him the most extensive patronage.

We will now enter the studio in Regent Street, at the entrance of which we find Mr. Williams' name, but no



indication of his profession. In a comfortable reception room, quietly furnished in good taste, we find examples of the work. We are at once struck with the fact, that amidst the variety of good pictures, there is one speciality in which Mr. Williams excels; it consists of the whole plate portrait, head and bust vignettes. The examples are all especially beautiful, with an almost preternatural delicacy in the rendering of flesh, so free from harshness, rugosity, or coarseness, is every round and perfectly modelled head. We see but one or two specimens of enlarged work, and these are placed aside, as if scarcely intended for exhibition. A peculiar

refinement is the prevailing quality in Mr. Williams' work, to which the practice of enlargement would not readily lend itself, and it never appears to have found favour with Mr. Williams. There are some very well-coloured specimens about 10 by 8 and 12 by 10, those in oil being especially fine. The cards are also fine, and generally very brilliant and forcible. There are no scenic backgrounds, but some good accessories vary the effect of a plain background, and in many instances a cast shadow of the figure on the background gives much breadth and relief.

We will now ascend to the studio, and proceed to some

details of its construction and arrangement. The size of the room is about 30 feet long by 17 feet wide. As will be seen from the engraving, the chief light is from a skylight, sloping in direction of the length of the room, not, as in the ordinary ledge or lean-to roof, in direction of the width. The glass extends the whole width of the room, and backwards in the length of the room for nearly 20 feet, the exact measurement of the skylight being 19 feet 6 inches by 17 feet. The height of the room at the ridge is about 16 feet, and at the eaves a little over 8 feet. The panes at the end of the room are generally covered with blinds, so that without management of blinds or curtains the room would be lighted almost entirely with a skylight facing the south-west; this is, however, by skilful management of the blinds and arrangement of the sitter, generally converted practically into a high side-light.

The sitter and the camera are placed cross corner-wise of the room; two backgrounds, one facing each corner towards the light, being generally placed as fixtures. We omit in the diagram these and some other details which we shall describe to give a clear view of the interior. Moveable wings, covered with blue calico, are placed at each side of the background, and at times are made to cut off direct light, and at others to act as reflecting screens. The skylight is furnished with three sets of blinds, each set consisting of three blinds, one above another: one of dark blue calico, one of thick white calico, and another of thin white calico or jaconet muslin. By the judicious management of these blinds almost any effect of lighting can be obtained. The diagram illustrates a mode of arrangement we have seen in use. Over one-third of the skylight and half of the next third the dark blue blinds are drawn to exclude almost all light; over the other half of the middle section a white blind is drawn, and also over the upper half of the remaining third. One-sixth of the skylight, and that the portion most remote from the sitter, admits the light through clear glass; and this, if the sun were shining, would be covered with the thin muslin blind. It will be seen that the principal light is often virtually a concentrated high side-light, the concentration giving the effective cast shadows to which we have referred, whilst the amount of softened light admitted through blinds lights up the shadows, preventing blackness or hardness. Besides the blinds already described there are two other dark blinds which can, on occasion, be used. These are tolerably near to the head of the sitter, and can be used to prevent any vertical light reaching it. All the blinds are on spring rollers placed near the top of the skylight, and can be, of course, readily drawn so as to cover any required portion of the skylight.

The backgrounds are each provided with an arrangement which permits them to be thrown forward a little at the top, and so produce a graduated shadow on the upper portion. For convenience in photographing standing figures, behind each background is the base of a head-rest, screwed to the ground. An aperture in the background permits a rod, carrying the rest, to pass through, and so steady the head by means of an unseen rest. The backgrounds are of a dark grey, in flatted oil paint. One point neglected by too many photographers we may note in passing, is the use of a very light background for vignettes, which renders the production of a delicate gradation round the head and shoulders comparatively easy.

A moveable framework, forming, with a dark cloth thrown over it, a large dark canopy or tent, is used to shield the camera and lens from diffused light, and also to reduce the amount of illuminated atmosphere between the sitter and lens. The camera is also provided with a black velvet covered screen, put in front of the sensitive plate, with an aperture of the size of the picture, to protect it against the action of any stray traces of diffused light; no pains of any kind being spared to secure the plate from the action of any light but that intended to produce the picture.

In the production of the whole-plate vignettes, Mr. Williams for many years used a French lens with sufficient spherical aberration to give diffusion of focus and freedom from excessive sharpness. Of late he has used for the same purpose the patent lens with diffusion of focus arrangement, which tends at once to softness and depth of definition. A full exposure is invariably given to aid in securing immunity from coarseness or harshness of delineation, especially where any tendency to wrinkles, freckles, or coarse texture is present.

Our readers are already familiar with details of the mode of operating pursued by Mr. Williams, and we need here only briefly recapitulate a few particulars. A good commercial bromo-iodized collodion is employed, the products of various makers being used, and often in combination. A 40-grain nitrate bath for winter, and one of 30-grains for summer use, in each case containing a trace of nitric acid. A 15-grain solution of protosulphate of iron with 15 minims of acetic acid is used for development. An under-exposed negative would be intensified before fixing; but if the negative be—as care is taken that it shall be—fully exposed, it is fixed by immersion in a dipping bath containing a saturated solution of hyposulphite of soda. After thoroughly washing, it is intensified in daylight by means of a 1-grain solution of pyrogallie acid, containing 15 minims of acetic acid and a few drops of a 15-grain nitrate of silver solution. This is used with great care, so as to secure a few brilliant points of new deposit, giving intensity in the high lights only. The general tint of the negative is also rendered more non-actinic by this treatment, and sufficient printing value is thus secured. The finished negative contains minute points of high light very dense, minute traces of bare glass, and abundance of varying gradations of semi-transparency.

In the printing operations great care is used. For the vignettes an aperture, graduated by means of cotton wool, is made to suit each individual portrait, and so give the best result in each case. The acetate toning bath is employed. The prints are never suffered to remain in soak all night; four hours' washing, with frequent change of water, each print being drained as it is changed into fresh water, is considered, and doubtless is, much more effectual in removing traces of hypo, than protracted soaking in water.

Every first proof passes through Mr. Williams' own hand, and receives his instructions as to depth of printing and toning: modifications in the vignetting are suggested, and a pencil outline of the most suitable form is generally traced. Every finished print, as a rule, also passes through Mr. Williams' hand; each undergoes a fastidious scrutiny, and is rejected if it have a suspicion of a fault, either in depth, tone, or vignetting, as well as for any more tangible fault. The scrupulous care and educated eye which detects the minutest fault and rejects everything defective, as well as great skill and fine taste, have contributed much to the rare success which has attended the career of Mr. Williams as a portraitist, and rendered his pictures almost synonymes of photographic excellence.

Mr. Williams is a man of retiring habits, and rarely takes an active part in photographic discussion or communication; but his experience has always been placed freely at the service of photographers, as our readers know, but with what a ready and winning courtesy those who have come into personal intimacy with him only know. Although no believer in secret dodges, he has always been a careful experimentalist, and photographers are indebted to his suggestion, in the early days of the collodion process, for some of the operations—such as the direct iodizing of a new bath, &c.—which are now amongst the things of course in the order of working. We must now conclude our somewhat extended visit to one of the most interesting of London studios.

OMNIUM GATHERUM: REMARKS ON VARIOUS PHOTOGRAPHIC TOPICS.

BY SAMUEL FRY.*

It is a sonree of considerable pleasure to me to have this opportunity of again meeting with the South London Society, a body with whom it was in past years my lot to hold frequent and pleasant communion. The circumstances of my residing at a distance from town, and having engagements in an arduous branch of our common art, have debarred me, to an extent that is to me a subject of regret, of much pleasant society of days of yore. Do not, I pray you, suppose that I have come down here with some new invention, a fresh dodge, another wrinkle, far from it; I am simply here to hold a little converse with you on matters that interest us all alike. On some of these points hot disputes have arisen, on others misapprehension exists, on yet others our future course is veiled with the clouds of doubt and anxiety. Past, present, and future, then, it occurs to me that if, before finally coming to conclusions, we just sit down and come to some agreement as to the real meaning and significance of terms, of what is, and what should be, the actual object we hold in view, our progress may be advanced.

First, then, I think I violate no confidence when I relate as my primary theme the question which has now for so many years anxiously agitated the photographic breast: Can we make our pictures permanent? Gentlemen, whatever may be the answer to this question, I think we must consider that the numerous panacea which have been offered us to ensure it in future show a very strong doubt as to whether we have hitherto been very near it in our practice. Now I claim to be rather a practical photographer than a profound chemist, and I am strongly imbued with the belief that we have in our possession the means of making a photograph as 'permanent as there is any need it should be.

If people will, as I know they do, plunge masses of pictures wet with hypo into a water tank, and think because it has a syphon arrangement it is all right, they are sure to fade; and if they take them out and dry them in blotting-books for months together they will also very soon fade. I know a large establishment where this latter is done, and they go rapidly. But if, on the other hand, you use hypo once only, when the pictures are removed, have each one washed on a slab of slate or marble with a broad brush under a tap, and the whole lot well washed for five minutes before they go in the tank, and the same again three hours afterwards, and then be dried, I say emphatically, and I challenge contradiction, these prints will not fade. Are any such conditions as these generally observed? Not a bit of it. Hundreds of prints are daily put straight from the hypo into the water, and only taken out to be dried.

It is a fact, readily proved, that the greasy hypo fluid adhering to the prints cannot be removed by mere contact with water; but a mechanical appliance, such as a brush under a tap, instantly clears it away. Some may say, "What a while it will take!" but I hope to hurt no one's feelings when I say that if all be true that's repeated, a very few have such large batches of prints as to make the time thus occupied any object.

It is a startling evidence of the doubt that pervades men's minds on this important subject that now, in 1868, it is deliberately proposed, by good authorities, to return to the fixing and toning bath in one. It was an awful thing, and required some temerity to fairly put down in black and white such a proposition, and, strange to say, the idea is not scouted, for, from the latest experiments by Mr. Cherrill, using sulphate of ammonia with the toning and fixing solution, the picture can be demonstrated to contain a far smaller quantity of matter liable to change than has ever before been obtained. I have repeated and verified these experi-

ments, and hasten to express the pleasure with which I found that pictures thus fixed resisted the action of the potent fluid in which it was immersed; whilst an ordinary print, toned and fixed with hypo only, though washed with great care, immediately gave way. Perhaps we have here a happy issue out of all our affliction as regards permanence. The real question is in a nutshell: Have we greater permanence with separate toning and fixing than we had before? Some, who look upon fading as a natural sequence to printing, have conceived the thoroughly human idea that if we could not prevent, we might conceal, the fatal germ of death which seemed congenital to our productions, by enveloping them in a transparent coating of varnish or collodion. I have carefully tried these methods, and believe them worthless for the following reasons:—

Varnishes are composed of gums dissolved in certain spirituous or etherial fluids, and it is the aim of the maker to so blend his constituents in the liquid as to obtain a balance of focus between the elastic and the brittle gums, that, without anything like stickiness, there shall be elasticity to allow of contraction and expansion from atmospheric changes, and yet the hard transparency of more frangible vegetable gums. In their normal state varnishes are waterproof, but unless made very thick, and, therefore, opaque, will not long remain so, especially if the atmosphere have access to both sides. Handling, moisture, frequent change of temperature, even within moderate limit—within a very moderate period—destroy most varnishes, and they become friable, and, falling away as an impalpable powder, their uses are greatly diminished. Even where they do not thus act thus, time and light as surely yellows them as it does the leaves of autumn. Concentrated experiments to test the resistance of varnish are no criteria as to their value: the slow disintegrating influences I have mentioned cannot be thus estimated. It has been hinted that if the picture be mounted with india-rubber the print is hermetically sealed when varnished. I pray you dismiss any such idea. If you want permanence do not seek it by imprisoning your enemy: keep him out from the commencement.

There is strong reason to suppose india-rubber to be utterly worthless as a mountant; it is a vegetable gum, and exhibits the usual effects of atmosphere on such productions, losing its cohesion, and becoming a mere brown powder in a few years. Some have supposed india-rubber—as seen in commerce—to be the skin of the elephant and rhinoceros in a state of subdivision. This is not correct.

I pass now to collodion as a protective. I very carefully tried this, and had great hopes of it, but it itself turned yellow, and, exhibiting a surface partly smooth and partly rough, showed its protective power to be very uncertain; a few months made it quite pulverulent. But having thus referred to protective agents that are no protection, I will just advert to what I believe to be a most valuable protection, viz., an encaustic or ceramic pomade whose basis is pure white wax. We know white wax is permanent, because in Egypt and other countries, where it has been the practice to embalm or preserve bodies from destruction, the principal agent has been the cerecloth, which has not only resisted permanently the destructive effects of time to an unprecedented extent, but may be seen in the British Museum in a perfectly sound condition; whilst the varnishes, essences, and perfumed gums enclosed within the whole, although thus perfectly excluded from atmospheric influence, have utterly perished. White wax is a thoroughly reliable substance as a protective agent, and it is to a judicious application of it, in conjunction with certain mollifying ingredients communicating softness without greasiness to the preparation, that Salomon's pictures owe much beauty. The surface, and not only the surface, is proof permanently against fair usage, or the effect of moisture or vapour; besides which the effect on the picture is very valuable. It is not a gloss which is given; it is a rich liquid depth and enhancement of vigour and softness combined.

And now about carbon printing. This is, as far as we are

* Read before the South London Photographic Society, February 13, 1868.

aware, permanent; we must not forget that there has been bichromate of potash used as a sensitizer, and that the whole picture is supported on a substratum of an organic nature which has been under the influence of this powerful chemical as a sensitizing agent. The tests employed to discover the presence of the destructive substances in silver prints are inert against carbon; and it has not yet been shown that there is left anything which can militate against its permanence; but it would be well to be quite clear on this matter. And now then, why, if carbon printing is thus permanent, if it unquestionably possesses that great virtue so long sought in vain; if, in a word, it is the solution of this great question of permanence, why is it not generally adopted? I ask this in no partisan spirit, but simply because it is a question continually put in any company where photographers meet. All admire the results, the full details are before the public, any one can purchase the materials, and no special commercial difficulties are imposed by the patentees. Why, then, is it unworked by the main body of photographers? I believe the primary cause to be that it is a blind process; you cannot watch the printing, and have to risk the results at the end of the day.

Mr. Cherrill, who has probably achieved as great success as any one in it, says it is the sort of thing to do your "best work in." If you want a thousand impressions, the negative may be learned by the actinometer, and good success obtained; but when, as is almost always the case, a heterogeneous batch of negatives are out printing, very small success has comparatively been required from each, and there seems difficulty in meeting the case.

Mr. Mayall states also that he is unable to print his small pictures economically by it. I do not mean cheaply, but on anything approaching a commercial scale.

In company where septs and arch-heretics sometimes congregate, I have heard the opinion often expressed that carbon in many cases fails to give the depth and brilliance of silver printing. From my own personal comparison of some of Bedford's choice landscapes in carbon and silver, the latter were far preferable. I have also a pair of Mr. Blanchard's celebrated "Scholar and Zealot," silver printed, which most agreed to be finer than the same in carbon. In discussing such a matter, we must remember we are only feeling our way, and that much has had to be *unsaid* in photography: where knowledge ends, there dogmatism too often begins. We have not yet seen the last of silver printing, nor are we likely to.

Just one more subject, and I have done. What about business? When these societies were established, most of the members were amateurs, but I fancy the professional element has of late years predominated. Great complaints are heard on all sides of slackness of business; but I sometimes think that if photographers were a little more versed in political economy they would perceive that not only is it no wonder our craft suffers, but that it suffers severely. Whether we recognize it or no, all businesses are subject to the immutable laws which regulate commerce—the laws of supply and demand; no artificial treatment has yet been able to create demand when the supply was excessive. Gentlemen, look around you at the state of every industry that can be named, and nothing but disaster can be seen. Look, again, at the number of professional photographers, enormously in excess of demand. The card mania called them into existence, and with the reduced demand came necessary depression. The issue of photographs, notwithstanding this, is more enormous than ever, and if any evidence were wanting to correct the erroneous assertion that the flatness of trade is owing to the public being aware that they are not permanent, it is supplied on a consideration of the immense numbers and various kinds now being used. Numbers of books are published; copies of works of art, collections of paintings from national galleries, are in daily increasing demand. I have good reason to believe that such quantities of paper, collodion, silver, and gold were never before used as now in producing photo-

graphs. But the demand for portraits has simply taken its natural position; unless a new mania arise, it will probably not be less than now, and it is evident that a fraction of the portraitists now existing will be required. But let no one think photography is going to the bad; its importance and value are more recognized daily; and in most of the important industries of the world it is usefully employed, for the simple reason that "truth," as embodied in photography, is recognised as a "household word."

A SUGGESTION FOR A NEW MODE OF TREATING AN OLD NEGATIVE BATH.

BY J. R. JOHNSON.*

A GREAT Northern Wizard has promised the photographic world that by one stroke of his magic wand he will convert the collodion process, so delicate and uncertain in practice, even in the hands of experienced operators, into one absolutely definite and certain, so that a thousand negatives may be taken in succession without the risk of one failure.

Until this has been accomplished, any new fact which may tend, however slightly, towards this end will, I feel sure, be accepted by photographers with pleasure; and I make no apology therefore in calling the attention of the members present to one such fact which appears to me to have this tendency in not a slight but in a considerable degree.

It will, I think, be generally admitted that one of the chief sources of failure in the collodion process arises from the instability of the negative bath. That the bath should show this instability is not at all to be wondered at, inasmuch as it is undergoing a constant change of composition by the immersion of every fresh plate; the water holding the silver salt in solution becoming thereby gradually removed, and replaced by other fluids, viz., alcohol and ether. These are fluids whose elements enter readily into other combinations, but they are also necessarily more or less impure, containing small quantities of other analogous substances, and traces of oils, the nature of which varies according to the source from which the original wine or malt spirit employed in their production was obtained. We know well that when these fluids have accumulated to a certain extent, we find that the salt of silver becomes reduced without the action of light, and this reduction taking place over the whole surface of the picture, we have what we call "fog," and we fail then to produce vigorous negatives. Sometimes this reducing action takes place in the bath itself, when we have a deposit in an infinite state of division diffused through the bath, and showing but little signs of deposition, unless as a specular film on the sides of the vessel. When this is the case a few drops of cyanide of potassium, forming a clot of cyanide of silver, if well shaken with the silver solution, will entangle the attenuated matter in suspension, and will carry it to the bottom, thus clearing the bath, and removing the cause of fog. At other times the action is only shown on the iodized or bromized plate, the bath itself being clear and bright. In this case the cyanide appears to have no action; and I knew, until lately, no other way of clearing the bath from this source of fog than by rendering it alkaline and putting it in the sun. The action of light being added to that of the reducing agent, a portion of silver is deposited, while the reducing agent itself is destroyed, probably by oxidation, and the evil is cured.

About two months ago, Mr. W. Morgan Brown, Secretary to the late United Association of Photography, informed me that he had been troubled with a bad bath, and had tried several modes of curing it in vain, until, in his despair, he had put in a few drops of Condy's disinfecting fluid, when a complete cure was effected.

I paid but little attention to the matter at the time, but having read Mr. Crookes' excellent paper "Upon the Purification of Water by Permanganate of Silver," I was reminded

* Read before the London Photographic Society, February 11, 1868.

of Mr. Brown's communication; and I determined to try whether the reducing agent of a fogging-bath might not be oxidized by the direct action of a permanganate, and, to my great satisfaction, the experiment was highly satisfactory. A few drops of a 20-grain solution of pure permanganate of potash added to an old bath first coloured it of a fine purple, which gradually changed to a turbid brownish hue completely removed by filtration. If the addition be made in sufficient quantity, the bath is completely cured of its foggy property, and a vigorous picture may again be obtained with it.

Not having a large stock of old bath at my disposal, my experiments have necessarily been limited, and, indeed, confined to one specimen of bath. Strictly speaking, therefore, it is only one form of the reducing agent to which my remarks refer, and the result may not be the same with other specimens of bath, in which the reducing tendency may arise from other kinds of collodion or from admixture of organic matter from other sources than the collodion. The experiments, however, of Mr. Brown and myself establish the fact that a permanganate may be used to oxidize organic matter in the bath without detriment to the remainder; and, as we know that the permanganate gives up its oxygen to all kinds of organic substances, there can, I think, be but little doubt that it will be found generally applicable. I have, therefore, hastened to communicate the fact at once, so that it may be tried by all photographers who read the record of our proceedings, trusting that they will give the suggestion a trial, and will report to us their results. More facts will be obtained in one week by this mode than an individual could acquire in many months' experimenting.

Before concluding, I would remark that, on mentioning the subject to Mr. Werge to-day, he informed me that Mr. Tully, of Sheffield, had for some time used permanganate of potash to clarify his printing baths instead of kaolin, and that Mr. W. had mentioned this fact to other photographers. We have here a perfectly analogous use of this substance, the substance oxidized and removed being, however, albumen or its derivatives which injure the positive bath, instead of the organic compound, or compounds, yielded by the alcohol or ether to the negative bath.

ANNUAL REPORT OF THE COUNCIL OF THE PHOTOGRAPHIC SOCIETY.

THE Council of the Photographic Society, in rendering its Annual Report to the members, feels considerable satisfaction that, after a year of unprecedented depression in many phases of the art of photography, it is able to congratulate the members on a more promising condition of the Society than has existed for some time, evidences of which may be found in the fact that a larger number of interesting communications have been brought before the members at meetings, and that an exceedingly successful exhibition has been held.

It is a source of congratulation that, during the fifteen years of its existence, the Society has, by the maintenance (at a large cost) of public exhibitions, by the founding and maintenance of a journal, which during many years was the only means of intercommunication amongst photographers, of announcing the continual progress of discovery and improvement, and of preserving a record of each step in advance made by the pioneers of the art, materially aided in placing it upon a solid basis, and contributed to the prosperity and advantage of all associated with photography, either as amateurs or engaged in its pursuit as a profession.

In looking at the general progress and present position of photography, and its now variously ramified applications, the Council cannot omit taking occasion to congratulate photographers on the solid advancement which has been made in their art. Prominent amongst the accomplished facts of the present day, which but a few years ago was amongst its hopes and aspirations, may be mentioned the discovery and working out to a practical issue, by one of the members, of a means of producing photographs in permanent pigments. Mr. Swan's carbon process, the announcement of which was first made to the Society four years ago, as then little more than an experi-

mental possibility, is now the means of issuing every week thousands of photographic prints as imperishable as the productions of the painter and engraver. Mr. Woodbury's process of photo-relief printing, also introduced by its inventor, a member of this Society, at a more recent period, is now also a means of producing, with the rapidity of the printing-press, permanent pictures, with great perfection and truthfulness of detail. Permanence in silver-printing has also received much attention and considerable aid from members of the Society; and the papers read by Mr. Blanchard and Mr. Spiller during the past year may be regarded amongst the most important contributions of the Society to the progress of this branch of our art. The optics of photography have received great impulse from the contributions of the members, and the papers of the late M. Clandet and of M. Dallmeyer, and from the discussions arising from their papers read during the year. Dry-plate photography, amongst the many contributions which have, during the past year, aided in securing its practical perfection, has received an especial impulse from the paper of Mr. England, who, in his communication, described a process which has for the first time proved as commercially available as the wet process for the practice of professional photography.

Without entering into further details upon the numerous and important steps in advance which have been secured in the art, the Council submits a list of communications which have been received at various meetings of the members, and at the same time direct attention to the fact that they are more numerous and important than usual, no meeting of the Society having been held at which one or more interesting papers was not read:—

Dr. Wright, on the Medical Uses of Photography.

Mr. A. Clandet, on a Photographie Unité of Measure, for calculating any enlargement or reduction of photographic reproductions, and all respective focal distances and distances of objects.

Mr. Holwell, of Bermuda, on Mr. Clandet's Invention for the Distribution of Focals.

Mr. A. K. Sparke, of Plymouth, on a New Developer.

Mr. Mouckhouse, on a Water Agitator for washing photographic prints.

Mr. Jabez Hughes, on Papers—How to write them, and What to write about.

Mr. W. T. Bovey, on Printing on Canvas and Wood Blocks.

Mr. W. England, on a Modification of the Collodio-Albumen Process, requiring but one sensitizing bath.

Mr. A. Clandet, on the Optics of Photography—on a Self-acting Focus Equalizer, or the means of producing the differential movements of the two lenses of a photographic optical combination, which is capable, during the exposure, of bringing consecutively all the planes of a solid figure into focus, without altering the size of the various images superposed.

Mr. V. Blanchard, on the Best Means of rendering Silver Prints Permanent.

Mr. Dunmore, on Bromo-Rice Paper.

Mr. J. H. Dallmeyer, on the Cause of the Central Spot or "Flare" in Photographic Lenses; and on a New Form of Wide-angle Rectilinear Lens entirely free from this defect.

Mr. Jabez Hughes, How is the Status of Professional Photography to be raised?

Mr. J. Spiller, Researches on the Hyposulphites and other Fixing Agents—Part I.

The following interesting objects have been exhibited during the session:—

Dr. Loewo, Specimens of various Solutions for Printing on silk, linen, wood, leather, ivory, and other substances; also prepared paper and photographs on various materials.

Mr. N. K. Cherrill, Photographs printed in Carbon.

Mr. Good, a Frame for Touching Negatives.

Mr. Griggs, a Photo-block.

Mr. J. R. Johnson, a Multiplying Camera.

The Council has pleasure in stating that arrangements have been made for the future management of the Society, which, without in any degree crippling its efficiency, will very considerably further reduce its annual expenditure.

The Council has especial pleasure in mentioning, amongst the most important means of reducing the expenditure of the Society, a voluntary tender on the part of their Secretary to resign the amount of salary he has hitherto received for discharging the duties of that office, and of undertaking, for such time as may be necessary, the position of Honorary Secretary. The Council, in accepting the offer of Dr. Diamond, feels

assured that the Society will join with it in tendering their cordial thanks for the liberal spirit in which he has undertaken onerous and important duties on behalf of the Society without any charge upon its funds.

The Council further has pleasure in referring to a source of reduced expenditure and increased comfort, which is found in the change in the place of meeting from the Library of King's College to the Gallery of the Architectural Union in Conduit Street. In opening its session at the commencement of the present winter, the Society, in accordance with an announcement at the termination of last session, had arranged to hold an exhibition meeting to which photographers generally, as well as its members, were invited to contribute illustrations of the progress made during the year in the various departments of the art. On application to the authorities of King's College for the use of their meeting-room a few hours earlier than usual, in order duly to display the contributions which had been invited, it was found that no departure from the usual routine as regards the use of the room would be granted; and the Council were compelled to look elsewhere for rooms in which the exhibition meeting could be held. This accommodation was granted with much courtesy and on exceedingly moderate terms at the Gallery in Conduit Street, at which the meetings are now held. The greatly extended accommodation, and the comfort and convenience which attended the proceedings of the first evening induced the Council to enter into negotiations for the occupation in future, for meetings and other purposes, of the Gallery, in which the opening of the session was inaugurated; and they have pleasure in congratulating the members on the success of these negotiations, which have issued in a change in every way advantageous, at a cost little exceeding half the amount they had hitherto paid for rent.

The Council has already referred to the very great success of the exhibition meeting held on the 12th of November last. The response made to the invitation of the Society was far beyond anticipation, and a very large number of photographs of much excellence were forwarded for exhibition. Impressed with the importance of giving, if possible, an extended opportunity to photographers and the public to examine the choice display of pictures hung in the gallery, the Council made arrangements to continue the exhibition for a week longer, during which time the rooms were opened to the public free of charge, and a considerable number, probably exceeding 2,000 persons, availed themselves of the opportunity of visiting an exhibition of photographs which was, in many respects, unsurpassed in interest by any which had been held for many years. The success which has attended this exhibition has induced the Council to determine on a repetition of the experiment in future years, when it is probable that increased publicity and more perfectly organized arrangements will secure a still higher success and more complete satisfaction. The Council cannot leave this subject without expressing their gratification that the great impulse which public exhibitions afford to the progress of the art may be secured to photographers by arrangements similar to those of November last, without the heavy tax upon the funds of the Society which, continued during many years, so crippled its resources, and have acted so prejudicially on its financial position.

The Council has to announce with deep regret the loss it has sustained during the year by the death of two of its most esteemed members, Mr. Claudet and Mr. Thurston Thompson, both of whom had maintained to the time of their death a warm attachment to the Society, and an active interest in its welfare and progress. The Council had received considerable aid from the able assistance of these gentlemen for many years; and it and the Society sustained a deep loss by their lamented death.

In conclusion, the Council would impress upon members that the continued prosperity and progress of the Society are dependent on the co-operation of all its parts, upon the active discharge by individual members of personal duties, by regularity of attendance, by contribution of papers, by the exhibition of objects of interest, either as means of production or in the shape of perfection of results, by aiding in the discussion of all matter pertaining to the art brought before the Society, and upon the general activity of members in extending the influence of the Society, as much as upon the action of its Council and its executive officers, who are largely strengthened in their efforts by the tone of the Society generally, and a consciousness that every member is contributing, each in his own sphere, to the furtherance of the interest of the Society and the beautiful art which the Society was founded to promote.

Proceedings of Societies.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual Monthly Meeting was held in the City of London College, on the evening of Thursday, February 13th, Mr. SEBASTIAN DAVIS in the chair.

The minutes of a preceding meeting having been read and confirmed, Mr. J. F. B. Hassett was elected a member of the Society.

Mr. J. T. TAYLOR then read a paper on the "Oxyhydrogen Light, and Means of Avoiding Explosions," illustrating by means of diagrams on a blackboard the working of a valve he had used by which escape and mixture of the gases was rendered impossible. We regret that the extreme pressure on our space compels us to defer the publication of this paper until next week.

After some conversation on the excellence of the plan suggested, and a vote of thanks,

Mr. SAMUEL FRY read a paper entitled "Omnium Gatherum," consisting of observations on a variety of photographic topics (see p. 92).

Mr. WHARTON SIMPSON said it was quite refreshing to hear a paper on photography containing so many decided opinions and sweeping assertions, especially as it had concluded with a text, or motto, which he felt sure must have been kept in view in preparing the paper: he referred to the remark that where knowledge ended, dogmatism began. Remembering this as the motto of Mr. Fry's paper, they might fairly assume that the strong opinions expressed were based upon very careful examination of the subject. With the greater part of Mr. Fry's excellent paper he cordially coincided; but still, he thought, one or two points were open to further consideration. If the collodion, and resins, or gums which Mr. Fry had denounced as worthless for preserving prints because of their own perishable nature really were so liable to decomposition, their negatives were in a perilous condition, being formed of the one and protected by the other. He quite agreed with Mr. Fry that it was more important to expel the enemy than to imprison him; but having taken pains to get rid of him by care in the production of the print, he thought that some of these protective substances might be useful in keeping him out of the finished print. Varnish gave a vulgar surface which persons of taste in art could rarely tolerate; but he still thought that collodion applied as suggested by Mr. Blanchard, whilst it gave no vulgar gloss, ought to act as a protection to the print. As to the value of wax, he endorsed every word which Mr. Fry had said. Regarding carbon printing, many reasons might be given for the limited extent to which it had as yet been taken up. Where it had been worked on a large scale it was found easy, certain, and economical. Braun, of Dornach, was at the present time producing 500 prints a day, and was making arrangements to produce 1,500 daily. He was so convinced of their superiority that he had burnt his stock of silver prints. In his own experience, which was not large, but extended, perhaps, to the production of a hundred prints, he found that guessing the exposure was as easy and certain as guessing the exposure of dry plates. As to stability, the material composing a carbon print was very similar to the sizing on highly glazed writing-paper, consisting in both cases of gelatin rendered insoluble by chemical agency; and they might, he thought, as legitimately expect one to perish or decompose as the other.

Mr. BLANCHARD said that he could not help feeling that the position he had taken some time ago was the right one. Assuming that all had been done to render a print safe, it still consisted of silver and gold, and, as Mr. Spiller had shown, chiefly silver. This would, unless protected from atmospheric action, be liable to change, especially in sunlight, the silver remaining in the whites being manifestly liable to become yellow, as vignette pictures invariably showed. Hence the necessity of protective substances; and he believed that collodion was best. It was difficult to apply, he would admit, especially on account of the action of the ether. He now himself always applied wax, and had done for some time. As to any one putting prints into a tank, and after leaving them a few hours removing them as washed, he could not have believed it possible. In his own establishment they were always tested, after washing, with iodide of starch; but, notwithstanding every care, some turned yellow.

Mr. WERGE stated that he had some prints taken between 1855 and 1860 which remained perfectly good. They were washed in repeated changes of hot water, gradually increasing the heat to nearly boiling point, and then gradually changed down again to cold water. He had generally finished fixing by the use of a fresh strong hypo bath after the use of hypo and gold. He believed much of fading was due to the fixing and washing being left to ignorant people and boys.

Mr. HART referred to prints sticking together in the fixing and washing as a cause of imperfect treatment.

Mr. BLANCHARD said that a custom used to prevail of giving long immersion in weak hypo. He now used very strong hypo, and only immersed five minutes.

Mr. HASSETT referred to the importance of individual treatment of each print in fixing and washing. In toning we were compelled to do this, or we should have stains.

After some further conversation on the subject, in which Mr. Foxlee, Mr. Hart, Mr. Henderson, Mr. Blanchard, Mr. Fry, Mr. Simpson, and the Chairman took part, a vote of thanks to Mr. Fry terminated the proceedings.

Talk in the Studio.

MOUNTS FOR CARDS AND CABINET PORTRAITS.—We have recently received from Marion and Co. some examples of the cards they provide for mounting cabinet and card portraits, with a variety of designs and degree of excellence in printing them rarely met with. Every form of ornamental border and inscription for the backs of the cards are here found, and some of the cabinet mounts, with a neat line round the face of the card, to serve as a finish for the picture. Our own taste runs in favour of the quietest and neatest of the designs, of which there are many; but every phase of taste may here find something satisfactory.

NEW USE FOR A COLLODION BOTTLE.—A correspondent sends a suggestion which he thinks may be of service to his brother photographers. After describing a summer-house in a garden in which himself and family were in the habit of ruralizing on Sundays, he found one morning, when he arrived as the *avant courier*, that the matches were so damp that none would light, and, as it was Sunday morning, there was little chance of breakfast. The sun was shining, and an empty collodion bottle was at hand, the bottom of which seemed convex. It was quickly broken, and served as a lens or burning-glass to concentrate the sun's rays and light the damp matches.

To Correspondents.

NORTHERN LIGHT.—The lens which you describe has evidently a chemical focus; that is, the chemical focus and the visual focus do not coincide. To get a sharp image on your sensitive plate, the visual focus must be on a different plane to the ground glass. Focus the image sharp, on a point a little behind the face, say the ear or the back part of the head; or focus sharp as usual, and then give the rack a turn so as to throw the focus back a little, and try the result. 2. The plan you propose will doubtless illuminate your background more evenly; but can you not move the background so as to bring it within the range of such illumination as you now have? 3. See a leader in our present number.

ENQUIRER.—We have tested the cards forwarded for hyposulphite of soda. Nos. 1 and 3 are quite free from it; but No. 2 gives undoubted indications of its presence, and should be rejected.

E. G. H. X.—The specimens you forward have many excellent qualities. The tone and printing are very good, and the lighting is also good. The shadow cast by the curtain on the background has a very good effect. Your background is somewhat too dark for vignette portraits, and renders the gradation to the white margin somewhat abrupt. Study the articles on Composition at present appearing in our pages, and you will improve in that respect.

A.—You state the facts of the ease as regards the requirements in producing photolithographs with half-tone very fairly; but you do not include quite all the difficulties. The first requirement is to get the image on the stone with photographic gradation transformed into stipple; but this is not quite all. It must be in such a gradation as will not readily clog and fill up in printings, which a very

fine grain is apt to do; at the same time, it must be in a grain not too coarse to do justice to the photograph.

J. ARKWRIGHT.—The studio of which you send a model is, in all respects, very excellent, both in proportion and dimensions. With such an expanse of high side-light it is probable that you will generally find it desirable to have the skylight covered with blinds; or, possibly, to have a portion or the whole of it stippled in imitation of ground glass. This can be done, however, after trial.

BETA.—We believe that a thoroughly skilled workman in colouring photographs in oil may obtain plenty of commissions; but we have no connection with commercial photography which will enable us to assist in procuring such commissions. There are two modes of securing a connection: one consists in direct personal communication with first-class photographers, and the other in announcing your wish in our advertising columns. We shall have pleasure in examining a specimen of your work.

S. W. B. L.—The difficulty arising from facing the south is that whenever the sun shines it will render the use of blinds necessary, and the inconstancy of the light necessarily involves additional trouble; but with care and skill, and constant watchfulness of changing light, good results may be obtained in a glass room facing south.

D. S.—For landscape work the wide-angle single lens of the maker you name will answer better than the others, and for stereo work the patent lens of the same maker. The tent you name will answer well. The cards have some very good qualities. The vignette is a little too low down on the plate.

W. J. A. G.—You will find various articles on Sayce and Bolton's collodio-bromide process in the last two or three volumes. Mr. Sayce gives full particulars on p. 305 of our Ninth Volume, and an abstract appears in our YEAR-BOOK for 1866. We cannot tell you the extent to which the process is used. 2. We do not know the nature or composition of Cleaver's Photographic Soap. 3. *Punch's* proposed tax on photographs would not affect amateurs. 4. You get a certain amount of the effect of the gelatino-iron developer by adding gelatine to the developer. See the chapter on the subject in our last YEAR-BOOK. 5. As a rule, about 4 or 5 ounces of water added to 1 grain of gold will answer well, whatever other salt may be added.

MORPHINE.—As plates prepared by the morphine process are very sensitive, the strong light of a gas flame will be dangerous if too near the plate. Drying in front of the fire would also be dangerous. A solution of wax in benzole is good for edging the plates.

H. S.—There is no work devoted to enlargements. It is difficult to state which is the best method of enlarging, as various methods each have their specific advantages for especial purposes. You will find detailed instructions for transferring the film in our article on camera enlarging at the end of last volume, and also in our last YEAR-BOOK. We tried the bath, and did not find any tendency to the streaks described. We intend to try it again, however, with several samples of collodion.

MINIATURE.—The best method of printing on ivory with which we have had practical experience consists in the use of a powdery collodion saturated with nitrate of uranium, and containing 4 grains of nitrate of silver to each ounce. Print deep, and tone and fix as usual. The collodion film may be removed by means of ether, and the image will be found on the ivory underneath.

STEWART.—The facts you describe are perplexing. The paper presents no indication of decomposition or defect of any kind; but, from your account of the circumstances, it appears difficult to assign the defects in the print to any other cause. If it be really the result of a change or decomposition in the paper, we fear that there is no cure; but we should like to examine a little further before pronouncing the paper in fault. Send us a piece excited on your bath, and we will also excite that sent, and test both samples.

W. G. G.—Your letter of February 4th, having been put aside in order that the soluble cotton might be tested before giving an opinion upon it, was overlooked until now. The pyroxiline seems to be very excellent; we find that it dissolves readily and perfectly at the rate of 6 grains to the ounce, and would dissolve in much larger proportion; but that is about the right quantity for use. The film is structureless and quite transparent, and the collodion will, we doubt not, work well.

IGNORAMUS.—There are no curtains or blinds to the top-light, the canopy over the head of the sitter serving instead. The side curtains are of blue calico. 2. Yes; the plan you propose is similar. 3. Paste made of white wax dissolved in an essential oil; it is applied as wax is employed for polishing furniture. We shall have more to say on this subject shortly.

A REPRODUCTION from an oil painting of an ox has reached us without any note of reference to it. We shall be glad to hear from the correspondent who sends it.

An Article on the Financial History and Present Position of the Photographic Society, and several other articles in print, are compelled to stand over until our next.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 495.—February 28, 1868.

CONTENTS.

	PAGE
The Photographic Society of London	97
Photography and Disease.....	98
Modified Carbon Tissue	99
The Use of Clouds as Backgrounds in Portraiture. By Lux Graphicus.....	99
Distilled Water in Photography. By Nelson K. Cherrill	100
The Magic Lantern and Photography. By James Martin.....	101
Pictorial Effect in Photography. By H. P. Robinson.....	102

	PAGE
Concerning the Oxyhydrogen Light, and the Means of Prevent- ing Explosions. By J. Trail Taylor.....	103
Concentration of Light in the Studio. By E. Danmore.....	104
Infringement of Copyright by Photography	104
Proceedings of Societies—French Photographic Society.....	105
Correspondence—M. Salomon's Portraits—Silver Printing	106
Talk in the Studio	107
To Correspondents.....	108
Photographs Registered	108

THE PHOTOGRAPHIC SOCIETY OF LONDON.

At the annual meeting of the Photographic Society, held on the 11th instant, Mr. Glaisher expressed a conviction that the Society had reached a turning-point in its history, and, in one sentence, indicated the cause of the difference between its present and its former financial position. It was, he said, at one time *fashionable* to patronise photography and support the Society; the fashion had passed away, and the Society was now, and had been for some time, dependent simply upon ordinary resources. Nevertheless, many of the expenses, originated when funds were exceedingly ample, had been continued after its sources had been diminished. After a due examination of all the facts, and a preparation to meet the necessities of the case, he believed the Society to be in a healthy and promising position.

We have no hesitation whatever in expressing our conviction that the Society is in a healthy and promising condition. We say this advisedly after a careful examination of the facts and a consideration of the desponding views of some of the friends of the Society, and the evil reports of some who are much otherwise than friendly in their wishes as well as in their prognostications. There are, in most communities, some malcontents who, from personal pique or for the purpose of gaining personal ends, are ever ready to sow the seeds of disaffection; and there are also—fortunately, probably, for the progress of improvement—generally some honest reformers who readily believe in the existence of grievances, and who mean well in their denunciation of real or fancied abuses. To either class the discovery of a declining financial position presents obvious matter for alarm or denunciation. Nevertheless, we see little ground for anxiety in the admitted declension in the funds of the Photographic Society. We think that a brief glance at the facts will justify the position we have assumed.

We may first premise that a prosperous financial position would very inadequately represent success in a society established to promote the welfare of an art-science like photography. It might rather suggest lack of activity, or apathy in the discharge of duties involving expenditure of the funds existing for a specific purpose. Let us, however, briefly glance at the financial history of the Society.

At the end of the first year of the Society's existence the amount received from members was nearly £650; but this included not only subscriptions, but entrance-fees and the compositions for life-membership, more than half that

sum, therefore, arising from sources which could not occur again. For a few years, however, the income, from subscriptions, from profits upon exhibitions, and from profits upon the Journal, continued to be in excess of the expenditure until, in 1857, the Society possessed over £1,000 of funded property. Then began a change, and the expenditure exceeded the receipts, a state of things which has, we believe, continued ever since. In regard to the profits to which we have referred, it should be observed that, although the journal was not established as a commercial speculation, but to supply a means of inter-communication between photographers and of promulgating information conducive to the advancement of the art, being alone in the field, or nearly so, it soon became in the nature of things a source of profit; and, equally naturally, since the progress of photographic journalism as a private enterprise, it has ceased to be a source of profit, as the monthly organ of a society could scarcely be supposed to compete with financial success against weekly journals conducted with commercial energy. The exhibitions, during the novelty of the art, were also sources of profit, the receipts on some occasions having reached nearly £350; whilst in later years, when the attractions of novelty and the glamour of fashion wore off, the receipts became almost *nil*, whilst the expenses were as heavy, or nearly so, as before.

But what became of the funded property? may be asked. Was it wasted, or was it spent in promoting the progress of the art and the welfare of its devotees? We think that it can easily be shown that it has been expended in the main with a view to the promotion of the art and for the benefit of the members: whether on all occasions with judgment or not is another question; but any doubtful judgment which has been manifest belongs to years gone by, and is in nowise attributable to the successive councils which have been in office for at least the last half-dozen years. The heaviest drain upon the funds was occasioned by an attempt to provide a permanent home for the Society, where reading rooms duly furnished with photographic literature, laboratory, glass room, &c., for experiment, the other paraphernalia of a photographic institution, and a constant attendant should always be at the service of its members. The premises taken in Coventry Street for this purpose cost the Society, for alterations, furniture, fittings, &c., about £700; the whole of which, or very nearly, was eventually a total loss to the Society, besides the heavy loss involved in a two years' tenancy at £300 a-year. The intention was doubtless a worthy one; but the project was not successful, and had, after two years' trial, to be abandoned.

Other sources of loss followed: some, doubtless, from expenditure of value to the art; others of a less satisfactory nature. Foremost amongst the extra sources of justifi-

liable expense was the aid given to the committee for ascertaining the causes of instability in prints. Next followed a series of exhibitions of undoubted service to the art, but involving heavy loss. Instead of a profit, as in previous years, the exhibitions of the years 1858-59 involved a loss of over £112, and the expenses of that year were nearly £60 in excess of receipts. Exhibitions of other years were also losses, and we find each year's expenses in excess of receipts, the expenses of the year 1860-61 being £354 in excess of income. Amongst the expenses of a less useful character may be mentioned upwards of £100 for the costs of the Collodion Committee, the report of which gave so little satisfaction; about £100 of costs were incurred in defending the Society's copyright in the title of its Journal, an expense inevitable under the circumstances, however little satisfactory in its nature; and some other trivial matters.

All, or the chief of, these heavy expenses, which absorbed its accumulated funds, belong, however, to the first decade of the Society's history, and although its disbursements have for years past exceeded the income, they have done so in gradually diminished ratio, and have been—we think it cannot be doubted—for legitimate aids to the progress of the art.

How, then, it may be asked, can it be affirmed that the Society is in a healthy or promising condition? The answer is simple and straightforward. It is because, by the exercise of energy and judgment on the part of the Council, and the aid of earnest members, the expenses have been diminished without crippling the activity and usefulness of the Society. The year just concluded shows a less deficit than has existed for years,* whilst the vitality of the Society has been greater. There were more members elected last year than have been, we believe, for several preceding years; there were more papers read, and a better, although less costly, exhibition was held, to the great satisfaction of photographers generally.

Thus much for the past year. But the Society commences a new year under still more promising auspices. The Secretary, Dr. Diamond, has, with a liberality which those who know him know to be characteristic of him, resolved to resign his annual remuneration, and to continue his duties without any charge on the funds of the Society. With increased accommodation and comfort at the new rooms in Conduit Street there is a considerably reduced cost for rent and refreshment. These and some other sources of reduction in expenses will entirely change the financial position of the Society, and we look forward confidently to the next annual meeting for the novelty of a balance in hand instead of the report of a deficit. We believe that there is increased energy and interest also amongst the members. The year began well; at its first meeting, besides anniversary proceedings, a most valuable paper was read by Mr. Johnson, an interesting and illustrated note on experiments in lighting was read by Mr. Dunmore, and a most successful and instructive demonstration of enlargement made by Mr. Solomon. Two papers are promised already for March, and one for April. These circumstances, we are satisfied, point to a healthy present condition, and give promise of renewed vitality and prolonged usefulness in the oldest and most representative of existing photographic societies.

* The deficit for the year appears from the published accounts to be between £40 and £50. The expenses of the year appear to stand thus:—

Nett cost to the members of the Journal	£130	8	10
Secretary's salary	75	0	0
Rent and refreshments at King's College, including an unexpected demand of payment in lieu of notice	51	14	3
	257	3	1
Ordinary income of the year	214	15	0
Deficit	£42	8	1

A trifle more, it is probable, should be added to the expenditure for petty cash, &c.; against which, however, may be reckoned the year's stock of Journals on hand, many of which will probably be sold in volumes.

PHOTOGRAPHY AND DISEASE.

WE have on repeated occasions cautioned photographers against the careless use of cyanide of potassium and other dangerous poisons used in photography, the absorption of which through the unbroken skin was dangerously possible. We have also expressed a conviction that, conducted with ordinary care, there was nothing in the ordinary operations of photography which should have a detrimental effect on health. By ordinary care we mean the use of reasonably well-ventilated operating rooms; the avoidance of contact between the skin and poisonous solutions; and a similar avoidance of contact between the lungs and injurious vapours: all these are possible conditions, and ought imperatively to be secured. We have now to call attention, either to some new possible forms of injury to which photographers are liable, or, on the other hand, to secure some testimony to the effect that two of our correspondents who are suffering are under some delusion as to the origin of their symptoms.

We have received this week two letters from correspondents who seek advice from ourselves, or some of our medical readers, as to the cause and remedy of sufferings which they attribute to photography. The first is brief and indefinite, briefly and generally stating symptoms, and asking if they are known to be common to photographers. It runs as follows:—

"A SUFFERER would like to know if the Editor has had under his notice persons who have suffered from the effects of collodion, acids, nitrate of silver (cyanide sufferer does not use). The symptoms are as follows:—Attacks of biliousness; inaction of the liver, with a great deal of wind and spasms in the stomach; very acid stomach, and general indigestion. What would be the best mode to guard against these ailments? My life has been a misery to me for the last nine years, ever since I began photography; but as I like it I don't like to give it up. I have consulted most of the best doctors, and they don't seem to hit on the right thing for relieving me."

The symptoms described are, we fear, too common outside of photography: they may arise from various causes, and, so far as we can judge, they are not in anywise fairly traceable to photography or the materials used in its practice. Any occupation which overtaxes the nervous system, induces sedentary habits, and especially which occasions irregularity in taking food, may induce in a delicate constitution all the symptoms mentioned, quite apart from photography. The duties of a professional portraitist do not necessarily involve sedentary habits: the hours of work are not excessively long, but permit plenty of time for exercise, both before commencing and after concluding the day's work; but, too often, that exercise is neglected. The duties do, it is true, at times keep the nervous system on the strain, and they also not unfrequently involve irregularity in eating, a dangerous habit for persons of sedentary habits or weak digestion, which should be avoided. If the dark room be ill-ventilated, the vapour of ether and alcohol will also have an injurious effect; but this and similar obviously injurious conditions will, as a matter of common sense, be avoided by persons who suffer from imperfect health.

The next letter is much more specific as to the alleged source of injury, but scarcely so probable as specific. An occasional practical correspondent writes:—

"I have written to you several times before on practical matters; but this time I am sorry to say that it is upon a very different subject: a subject which, I think, ought to be made known amongst photographers, as my case appears to be different from any that I have ever read in the News. Still, there may have been such cases, although not published; and if, through the medium of the News, I could hear of a case similar to my own, and the way the case has been treated, I should be glad, as it might be some aid and comfort to me.

"Since last autumn I have been suffering very much from

illness at different times, although able to keep about, being much better some days than others, but all the time very weak and unable to attend to business (I mean the operating part of it).

"I have had strong suspicions that the chemicals have affected me for a long time; but as those used in the dark room are generally suspected and often condemned, I have always guarded myself against their action (I mean such as collodion, cyanide, &c.) But the real cause of my illness is nothing but the washing water in which the prints are immersed before toning, or rather the cause is the chloride of silver there formed. My blood appears thoroughly contaminated with it, and causes my limbs to be as though they were paralyzed, and often almost helpless. This is all caused through washing the silver off the prints with my hands before toning. I do not ever remember seeing that the washing water was ever dangerous before mentioned in your News, although I have the News from the commencement; so I would strongly advise all photographers to be guarded against the great danger there is in putting their hands into the washing water before toning. I can assure you that the feelings that it produces are anything but agreeable, and appear most difficult to get rid of.

"I have had ten years' hard work at it, and always was very healthy and strong; but now I am neither. I am now under a clever doctor, and he tells me had I let the case go on a very little longer I should have been quite hopeless, as my system is strongly impregnated with chloride of silver. If you have heard of any such cases before, and know of any remedy, I should feel glad if you would let me know. I am, dear sir, yours most respectfully, B. B."

This case, we must confess, somewhat puzzles us; and whilst we hesitate to doubt a statement so definitely made on the authority of our correspondent's medical man, we nevertheless feel considerable hesitation in the acceptance of the explanation of the symptoms given. Poisons are undoubtedly absorbed through the skin; but as a rule they must be in solution to admit of such absorption, and chloride of silver being insoluble, it is not in a condition for ready absorption by mere contact with unbroken cuticle. What effect would be produced on the system by chloride of silver once in the system it is difficult to say, as there are no records in the text-books of such a thing having taken place. It might be assumed to be comparatively inert, inasmuch as when nitrate of silver, which has a poisonous action, has been swallowed, common salt has been administered to convert it into chloride of silver, which is vomited and the poisonous action arrested.

The washing waters contain, of course, some nitrate of silver, and this may be absorbed and act injuriously. The symptoms of silver on the system, although rare, are tolerably well marked, producing generally discoloration of the skin. What is the effect on the general health we cannot state. Chloride of gold, as our readers have already had pointed out to them, may be absorbed by the skin and act injuriously. Sulphate of iron may be absorbed by the skin and produce symptoms analogous to local paralysis; but, as we often urged, none of these things need to be handled, and ought not to come into injurious contact with the skin.

As to the possibility of injury from the action of chloride of silver formed in the washing water, we cannot, of course, speak with certainty, and there can be no harm in using caution, as no photographic operation renders contact with chloride of silver necessary. We scarcely think it probable that the injury has arisen from the cause mentioned, but shall be glad to have the opinion of any of our readers whose studies or experience may enable them to throw any light on the subject.

MODIFIED CARBON TISSUE.

M. DESPAQUIS brought before the recent meeting of the French Photographic Society some examples of a slight modification of the carbon process, for which he claimed

certain special advantages. His description of the details of working is scarcely so clear as might be wished. The material used for the print he styles *papier-collodion-cuir*, or a paper of leather collodion. This appears to be the material described some time ago by Dr. Vogel in our columns as an agent superior to gelatine for transferring negatives, and used for some time by Mr. Woodbury in his photo-relief process. It consists of collodion to which castor oil has been added, and in some cases a little "driers."

M. Despaquis stated that, owing to the smooth oily nature of the collodion film, the adherence of the sensitive layer of bichromate and gelatine was so perfect that wherever the latter had been but very slightly acted upon by the light, a very thin insoluble film remained, which, of course, furnished half-tones of the most delicate description; this was not the case if the gelatine was supported by paper, mica, or a film of ordinary collodion, for the operation of washing, especially if the temperature of the water exceeds 60° C., has the effect of removing these finer gradations of tone. If desired, the surface might be rendered transparent or dull, and tinted to any colour. To produce a dull opaline surface the collodion paper is plunged into warm water prior to its perfect desiccation, the warmer the water the more dull being the appearance of the surface. The sensitive mixture is applied by allowing the prepared collodion paper to float on the same for a short time, the bichromate and gelatine being kept in a tepid condition during the process, and employed of a somewhat thicker consistence than ordinarily, in order to make it adhere more tenaciously. It is composed of—

Water	...	...	...	80 grammes
Liquid Indian ink	...	...	20	"
Gelatine	...	...	15	"
Bichromate of ammonia	...	...	2	"

THE USE OF CLOUDS AS BACKGROUNDS IN PORTRAITURE.

BY LUX GRAPHICUS.

THERE has long been in the world an aphorism that everything in Nature is beautiful. Collectively this is true, and so it is individually, so far as the adaptability and fitness of the object to its proper use are concerned; but there are many things which are truly beautiful in themselves, and in their natural uses, which cease to be so when they are pressed into services for which they are not intended by the great Creator of the universe. For example, what can be more beautiful than that compound modification of cloud forms commonly called a "mackerel sky," which is sometimes seen on a summer evening? What can be more lovely, or more admirably adapted to the purposes of reflecting and conducting the last flickering rays of the setting sun into the very zenith, filling half the visible heavens with a fretwork of gorgeous crimson, reflecting a warm, mysterious light on everything below, and filling the mind with wonder and admiration at the marvellous beauties which the heavens are showing? Yet, can anything be more unsuitable for forming the background to a portrait, where everything should be subdued, secondary, and subservient to the features of the individual represented—where everything should be lower in tone than the light on the face, where neither colour nor light should be introduced that would tend to distract the attention of the observer—where neither accessory nor effect should appear that does not help to concentrate the mind on the grand object of the picture—the likeness? Still, how often do we see a photographic portrait stuck against a sky as spotty, flickering, and unsuitable as the one just described! How seriously are the importance and brilliancy of the head interfered with by the introduction of such an unsuitable background! How often is the interest of the spectator divided between the portrait and the "overdone" sky, so elaborately got up by the injudicious background painter! Such backgrounds

are all out of place, and ought to be abandoned—expelled from every studio.

As the photographer does not possess the advantages of the painter, to produce his effects by contrast of colour, it behoves him to be much more particular in his treatment of light and shade; but most particularly in his choice of a background that will most harmonize with the dress, spirit, style and condition in life of his sitter. It is always possible for a member of any class of the community to be surrounded or relieved by a plain, quiet background; but it is not possible, in nine cases out of ten, for some individuals who sit for their portraits ever to be dwellers in marble halls, loungers in the most gorgeous conservatories, or strollers in such delightful gardens. In addition to the unfitness of such scenes to the character and every-day life of the sitter, they are the most unsuitable for pictorial effect that can possibly be employed. For, instead of directing attention to the principal object, they disturb the mind and set it wandering all over the picture, and interfere most seriously with that quiet contemplation of the features which is so necessary to enable the beholder to discover all the characteristic points in the portrait. When the likeness is a very bad one this may be advantageous, on the principle of putting an ornamental border round a bad picture with the view of distracting the attention of the observer, and preventing the eye from resting long enough on any one spot to discover the defects.

When clouds are introduced as backgrounds to portraits they should not be of that small, flickering character previously alluded to, but broad, dark, and "massy," so as to impart by contrast more strength of light to the head; and the lighter parts of the clouds should be judiciously placed, either above or below the head, so as to carry the light into other parts of the picture, and prevent the strongly lighted head appearing a spot. The best examples of that character will be found in the engraved portraits by Reynolds, Lawrence, Gainsborough, and others, many of which are easily obtained at the old print shops; some have appeared in the *Art Journal*.

As guides for introducing cloud effects, accessories, and landscape bits into the backgrounds of cartes-de-visite and cabinet pictures, no better examples can be cited than those exquisite little figure subjects by R. Westall, R.A., illustrating Sharpe's Editions of the Old Poets. The engravings are about the size of cartes-de-visite, and are in themselves beautiful examples of composition, light and shade, and appropriateness of accessory to the condition and situation of the figures; affording invaluable suggestions to the photographer in the arrangement of his sitter or groups, and in the choice of suitable accessories and backgrounds. Such examples are easily obtained. Almost any old book-stall in London possesses one or more of those works, and each little volume contains at least half-a-dozen of these exquisite little gems of art.

Looking at those beautiful photographic cartes-de-visite by Mr. Edge, I am very strongly impressed with the idea that they were suggested by some such artistic little pictures as Westall's Illustrations of the Poets. They are really charming little photographs, and show most admirably how much the interest and artistic merit of a photograph can be enhanced by the skilful and judicious introduction of a suitable background. I may as well observe, *en passant*, that I have examined these pictures very carefully, and have come to the conclusion that the effects are not produced by means of any of the ingeniously contrived appliances for poly-printing, recently invented and suggested, but that the effects are produced simply by double-printing, manipulated with consummate care and judgment,—the figure or figures being produced on a plain or graduated middle tint background in one negative, and the landscape effect printed on from another negative after the first print has been taken out of the printing frame; the figures protected by a mask nicely adjusted. My impressions on this subject are strengthened almost to conviction when I look

at one of Mr. Edge's photographs, in particular a group of two ladies, the sitting figure sketching. In this picture the lower part of the added landscape—trees—being darker than the normal tint of the ground, shows a line round the black dress of the lady, as if the mask had overlapped it just a hair's breadth during the process of secondary printing. Be that as it may, they are lovely little pictures, and afford ample evidence of what may be done by skill and taste to vary the modes of treating photography more artistically, by introducing natural scenery sufficiently subdued to harmonize with the portrait or group; and by similar means, backgrounds of clouds and interiors may be added to a plain photograph, which would enrich its pictorial effect, and enable the photographer to impart to his work a greater interest and beauty, and at the same time be made the means of giving apparent occupation to his sitter. This mode of treatment would enable him, in a great measure, to carry out the practice of nearly all the most celebrated portrait painters, viz., that of considering the form, light, shade, and character of the background *after* the portrait was finished, by adapting the light, shade, and composition of his background to the pose and condition of life of his sitter.

I shall now conclude my remarks with a quotation from Du Fresnoy's "Art of Painting," bearing directly on my subject and that of light and shade:—

"Permit not two conspicuous lights to shine
With rival radiance in the same design;
But yield to one alone the power to blaze,
And spread th' extensive vigour of its rays;
There where the noblest figures are displayed,
Thence gild the distant parts and lessening fade:
As fade the beams which Phœbus from the east
Flings vivid forth to light the distant West,
Gradual those vivid beams forget to shine,
So gradual let thy pictured lights decline."

DISTILLED WATER IN PHOTOGRAPHY.

BY NELSON K. CHERILL.

HAVING been much occupied of late with matters of more importance, I have not before found time to answer the remarks made by your correspondent, R. H. P., on my former paper "Against the Use of Distilled Water."

It appears to me to be more a matter of individual experience than of actual scientific investigation, whether or no distilled water is necessary in ordinary photographic operations; one thing seems pretty certain, however, viz., your correspondent is a very thorough believer in distilled water, and, moreover, he goes the right way about to get it by using his own still, and not trusting to the stuff they usually sell at the chemists for distilled water. Whether distilled water be required or no, I would say, avoid the supply unless you know where it comes from. Of course pure distilled water is to be bought, but there is a great amount of very impure water sold under the name "distilled." Much that is sold under this name is not prepared in proper stills made for the purpose, but is merely "condensed water" (as it is technically called) from steam-engines and boilers where no sort of pains are taken to keep it free from any impurity or contamination to which it is liable. Boilers are often fitted with "grease pumps," by which a little melted tallow or other grease is forced into the boiler when in action, to prevent its priming; the steam from this greasy water is condensed by jets of impure water from any source which may be at hand (all pumped up through greasy pump barrels and valves), and the delightful mixture so formed in the internal economy of the engine trickles out at a small pipe, and is often put up in casks and sent to London as "distilled water."

Then, again, I have often had distilled water (?) sold me which had quite a delicious perfume. No doubt it had been kept in a carboy or bottle which had not been properly washed out since last it held rose water or some such scent; and, as a rule, when I kept a supply of distilled water, it "went bad" in various ways, often throwing down quantities

of matter of different forms and colours, and sometimes even smelling. So, with all these things against it, I thought that distilled water was a delusion, and gave it up.

I have certainly succeeded well without distilled water, and I should much like to know if your correspondent has done better with it than I have without it, only I do not see exactly how such a comparison can very well be instituted.

It seems, also, that on one point your correspondent has slightly misapprehended my letter. He says, "It is like straining at a gnat and swallowing a camel," to ask and pay for pure silver and other chemicals, and then to mix them with the unknown impurities obtained in the water, &c. Now this is not exactly what I proposed to do. I proposed to use a means of ridding the water of the noxious qualities of its impurities by adding a little silver to it first, and then, should any precipitate form, filtering it out, and proceeding to make up the bath with the clear solution. This I hold to be an effectual way of removing the ill effects of inorganic impurities in common water, and I do not think that the usual water supply of our large towns contains enough organic impurity to do any damage; at any rate, I do not think it contains so much as the ordinary run of distilled water.

On page 83 of the *News* is mentioned a "remarkable natural brine," containing about 2,500 grains of soluble salts to the gallon. It is mentioned in the same paragraph that the use of this water in photography would be unadvisable; and then the passage goes on to say, "This circumstance might furnish a practical answer to the doctrine lately promulgated." This, I suppose, refers to my having suggested the use of ordinary water in photographic operations. But it must be remembered that I recommended the use of *common water*, such as is used for domestic purposes; and as "remarkable natural brine" is not common water, I do not see how its unfitness affects the question any more than the general unfitness of all kinds of brine, sea-water included.

I have not yet made any experiments with the permanganate of potash, but it seems to me much more likely to prove an effectual remedy against "fog" than even using distilled water, because, it must be remembered, that even when distilled water is used, there is no guarantee against *some* organic impurities, which, being more or less volatile, distil over with the water. I hope to make some experiments with this substance soon, and to report progress in due time.

However, whether this or any other means be good, it does not alter the fact, that I have constantly succeeded without using a drop of distilled water in any operation.

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 7.

THE next step is the painting of the foreground. For this purpose the palette must be set with all the colours. The foreground objects are the castle, the water, the reflections, the masses of rock, the figures, the sandy ground, stones, herbage, &c.

Begin with the most prominent object, the castle. Paint in the shadows with brown madder and madder lake, adding a little blue to produce the clear grey appearance of worn stone. The details of the ground on which the castle stands may be made out by a tint of brown madder; the general colour of the ground may be made of brown madder and blue, with a tint of burnt sienna; madder lake and gamboge for the lights; madder lake, madder brown, and Prussian blue for the half lights.

Distant trees may be tinted with madder brown and blue, and the same tint, with gamboge, for the lights. Nearer trees must be painted with gamboge and Prussian blue; the lights with gamboge and madder brown. The stems of trees are generally of a warm grey, and may be painted with

either a tint of gamboge, madder lake, and Prussian blue, or madder brown and blue. It is easier and much more satisfactory to mass in the foliage of near trees with the brush, and then take out the lights with the point of the penknife.

Reflections of objects on the surface of water are painted with the same tints as the objects themselves, and is best done at the same time. Should the water have motion—either from the force of the stream, from wind, or other causes—the forms of objects are reflected very undefinedly; but when the water is still they will nearly approach, both in colour and detail, the objects by which they are cast. Those parts of the water which do not cast reflections must be painted with tints corresponding in colour, but more grey in tone, than the surrounding objects.

And now the painting of the picture will have been done down to the line of wall bordering the lake. Take care to soften and blend all parts that require it with the dabbers. The road is gently undulating, and on the sides opposite and under the wall the lines are broken by means of grass. In this part nearly all the tints of the other parts are repeated, and the lights are introduced in broad masses. As the foreground is supposed to be so near the eye that all objects of which it is composed are capable of being minutely distinguished, not only as to their general form and colour, but that also their structure and surfaces are plainly visible, it is absolutely necessary that they should have substance, force, and detail. Detail is not to be understood as merely a faithful rendering of objects by truthful drawing, but also to mean a description of their various components, surfaces, and materials, so as to give an appearance of reality.

Sufficient force also must be given to the shadows to cause the middle and remote distances to retire. The lights of the foreground objects must of necessity be stronger than those of any other part of the picture, and consequently the shadows, as wherever the highest lights occur they are always supported by the deepest shades.

The work of finishing a picture consists of softening and subduing, or invigorating and brightening, those parts which may require it, with a view to harmony and general effect. For this purpose all the colours are needed with the addition of black, which is only used to give sharp touches here and there for the sake of sharpness and decision, and should not be used at any earlier stage, for fear of lowering the tone of the whole of the picture. All the edges of reflecting lights nearest the eye must be brought up to their proper degree of brilliancy, and all the dark parts strengthened to their proper depth; in fact, all that could not properly be done at an earlier stage must now be completed.

The figures and dark markings of stones or other objects are left to the last, as the force and tone of the picture, in a great degree, rests with them. When the composition abounds with tints allied to purple—as in the present example—the introduction of deep blue, bright orange, and crimson in the dresses or accessories of the figures in the foreground contribute greatly to promoting the effect of the picture.

Glass painting is also executed in water colours, and sometimes by a mixed process of using both oil and water colours, thereby combining the transparency of the one with the richness and depth of the other. The instructions here given will be found sufficient to guide the learner in the use of either process. Through the kindness of one of our most talented artists on glass, I am enabled to give his mode of preparing gamboge producing a most intensely brilliant yellow of any depth desired:—Dissolve half an ounce of gamboge in one ounce of alcohol, shake well, and let rest for twelve hours; pour off the clear fluid, and add to it an equal quantity of turpentine; stand the mixture in a warm place until evaporated to one-half. Use this colour with varnish or oil colours as required.

The instructions here given are equally applicable to painting a photographic transparency, or a picture from the outline to completion. The light edges of clouds are best taken out by means of the needle points before mentioned.

In concluding this part of my instructions, it may be as well to make a few observations, attention to which may serve the pupil in place of experience. A judicious choice of subject must be made, otherwise a pleasing picture will not be the result. It should be at a first effort of the most simple kind, and more difficult subjects attempted as experience is gained. When a picture has been finished to the extent of the ability of the learner, it is better not to continue working upon it at the risk of muddling the whole, but rather to let well alone, as experience will be gained from each following picture; therefore every effort must be made that each succeeding one shall be better than the last.

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PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHILAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER V.

"We cannot, as I have heard a great man express himself on another occasion, see at sight. A tolerably correct understanding of the construction and leading principles of an object is requisite, even to the seeing it properly."—*Opie*.

"Divested of design, art becomes a mere toy, a mechanical bauble, unconnected with either the head or the heart, uninteresting to the wise and good, unprofitable to all, and amusing only to the weak and idle."—*Barry*.

"Now do you see the point?"—*Mel's History of a Mystery*.

It is not necessary that the ruling point should be absolutely at the side of the picture and under the extreme distance. It will be found, by an examination of the best landscapes,

to vary very considerably; but if it be an important object it will never be found exactly in the centre, or under, or in a line with any other important or prominent form of the same size or character.

The little sketch subjoined illustrates how balance may be obtained by opposition of lines and light and shade, referred to in the last chapter. The lines of the tree and foreground oppose the lines of the mountains, and the light on the near objects contrast the dark distance.



I take for further illustration this week a river scene, the construction of which the student will be able to perceive for himself. He will notice that it is diagonal in form, and that the balance is preserved by the boat. He will also notice that the masses produced by the principal trees is repeated by the sail, and the light cottage is echoed by the distant church.

It is always well to point out not only what to do, but also what not to do; and there is a slight example of what to avoid in the present instance. It will be seen that the cloud immediately behind the top of the central tree exactly follows the shape of the upper branches, and the cloud just above partly repeats the same form. Now, repetition is a valuable quality in art, and helps to give one part of a picture relation to the other parts; but repetition should consist of a faint echo, and not of exact imitation of lines or forms; this would look too much like artifice, even if agreeable to the eye, which it would not be; and art, however



much it may regulate the representation of nature, should never make nature look artificial.

Having, I hope, carried the student with me so far, I should advise him, at this point, to study good pictures and engravings, and, analyzing them for himself, see how far the simple rule—beyond which we have not yet got—of a small spot of dark, or an opposing line, acting as a balance to the whole, has been observed, especially in representations of landscape. I venture to assert that if he does this appreciatively for the first time he will be astonished at the regularity and frequency with which this principle is observed. A study of pictures at the present stage will have a better effect on the student than a study of nature, which could, without guidance, only produce in him a vague and unsettled taste. The study of pictures will make him acquainted with the methods by which they were produced, and guide him, by means of the general heads of composition, in his search for the numberless and hitherto unperceived beauties in nature. Taking the best known collection of landscapes I can think of at the present moment, and at

the same time that of the greatest excellence, and because they are by a man whose genius was sufficient to carry him above and beyond all rules if he had thought it right to reject rules, I would recommend the student to go to the National Gallery and make a careful examination of the Turner collection; or, if he is not able to see the original paintings, let him look through the last half-dozen volumes of the *Art Journal*, in which many of these wonderful pictures are admirably engraved. Let him forget, if he can, the gorgeous colouring, and the poetry and imagination which appears in so eminent a degree in Turner's works, and prosaically examine the construction of the pictures; or, rather, at present let him confine himself to the one point I have suggested, and when he is well grounded in that he may advance another step without fear of having to turn back.

Taking a few examples at random, let me first direct attention to the lovely Devonshire landscape, "Crossing the Brook," where the dog in the stream forms the balancing-point of the composition; then turn to the "Temeraire,"

and notice how the buoy performs the same function. In "Brighton Chain Pier," "The Sun Rising in the Mist," "Ancient Rome," "Spithead," "St. Michael's Mount," "Stranded Vessels off Yarmouth," "Fishing Boats," and other sea views, a buoy, barrel, anchor, boat, or piece of wreck will always be found doing the same duty. In the "Polyphemus," the dark prow of the galley cutting against the sky give wonderful power to that glorious sunrise. It is the same with the landscapes proper. Look at "Petworth Park," and observe how the dark form of the doe standing against the light in the foreground appears to have been the last thing done, but without which the harmony would not have been complete. In the curious picture representing a scene in Boccaccio, called "The Birdcage," it will be seen that a *white spot*—the music book on the ground—has been used to complete the balance. Notice how almost invariably he places his darkest dark in immediate juxtaposition with his highest light, of which his "Dutch Boats in a Gale" is a good example. Notice, also, and remember how, in his wildest fancies, painted when some people think his genius had deserted him or almost amounted to insanity, Turner strictly obeyed the simple rules of composition. For example, in the "Whalers," and that weird and wonderful picture of so prosaic a thing as a railway train, to which he has given the name "Rain! Steam! Speed!" And if the greatest landscape painter that ever lived could approve of these rules, and bend his great genius down to them, it is not for the tyro in art, or even the advanced student, to say: "Art is above rules, which only act as a drag on invention, and curb imagination."

Having arrived at this point, having attained some knowledge of elementary pictorial construction, and having observed in pictures how that construction has been observed by painters, the student may now turn to nature, look on objects indoors and out of doors, carefully analyse any object or group of objects that appear to have a pleasing effect, and he will find, in some degree, that the cause of the pleasure he experiences in looking upon them begins to dawn upon his mind. Let him ask himself whether, even at this early stage of his knowledge, he looks upon nature with the same indifference he formerly did, and if he has discovered new sources of pleasure, through the medium of art, with which hitherto he has been unacquainted, and for which he never cared. If he has discovered new sensations and new enjoyments, he has put these lessons to the purpose for which they were written, and may go on with those that are to come. If not, he had much better give the matter up, or "try back." I ask this question thus early because if the subject of the three last lessons be not quite mastered, all I have further to say will appear but as so much confusion.

CONCERNING THE OXYHYDROGEN LIGHT, AND THE MEANS OF PREVENTING EXPLOSIONS.

BY J. TRAIL TAYLOR.*

ALTHOUGH for the production of photographic enlargements the lime light is, I believe, destined to be superseded at no distant day by the magnesium light, the latter, I fear, will not for many years to come enter into competition with the former for purposes where great steadiness is required, such as the exhibition of pictures in the magic lantern. At the present time, however, the lime light is extensively used in the production of enlargements; and, as it is the only light that can yet be used for purposes of exhibition, any means by which it may be improved will, I anticipate, be welcomed.

The lime light is of English origin. In the days of Sir Humphrey Davy a blow-pipe was introduced by a philosophical instrument-maker named Newman. It was a metallic vessel, into which air was introduced under pressure

by a force pump, the air being allowed to escape through a fine nozzle. The explosive and heating qualities of a mixture of two volumes of hydrogen and one part of oxygen were at this time well known; but Sir Humphrey Davy having discovered that the explosion from these gases would not communicate through small apertures, especially if under pressure, employed Newman's blow-pipe for effecting the combustion of the mixed gases. With this, Davy and Dr. Clarke, Professor of Mineralogy at Cambridge, tried numerous experiments, the heat obtained being the most intense at that time known. Lime, platina, strontia, alumina, rock crystal, quartz, flint, talc, emerald, lapis lazuli, plumbago, and other hitherto infusible substances, were all fused under this new and mighty power. When lime was brought under its action its incandescence was attended by a light of intense brilliancy.

By-and-by this property was utilised, and, among other applications, it was pressed into the service of the magic lantern. For many years, both in its heating and illuminating aspects, the gases were mixed together in a suitable bag or gas-holder, and many ingenious devices were had recourse to in order that no danger might follow their use; for Sir Humphrey Davy had, among his earliest experiments with this explosive compound, demonstrated that if certain conditions were disregarded, an explosion would result. His first and only explosion was produced with two quarts of the mixed gas communicating with the outer flame by means of a pipe an eighth of an inch in diameter, the gases being forced out under high pressure. On the light being applied to the burner the gas immediately exploded with a report like that of a cannon, the vessel in which they were contained having been shattered, and the *debris* projected with violence to a considerable distance.

One of the earliest experimentalists in the utilizing of the lime light was Lieut. Drummond, R.E., who, in 1826, communicated to the Royal Society a paper on the means of facilitating the observations of distant stations in geodetical operations, in the course of which he described a system of powerful illumination employed by him, which seems apparently to have been known previous to that time, viz., blowing a stream of oxygen through the flame of a spirit lamp. His using and recommending this light led to the designation "Drummond light" being applied to it. It may amuse you to be informed that I have three catalogues (issued within the past few years) of makers or dealers in magic lanterns, in which this light, described in 1826 by Drummond, is published as the newly-invented light of Mr.—, the dealer by whom the catalogue was issued. It may not be amiss to record here that, when compared with an argand burner, the Drummond light was found to possess thirty-seven times more intensity, magnesia only ranking as sixteen times. By a better selection of lime and more care in the adjustment of the flame, he afterwards increased the intensity of the light emitted from lime to eighty-three times that of the best argand burner of the period, supplied with the best oil.

For many years the mixed gases have been delivered through tubes packed with wire. Hemming's jet is an example of this. In later years the gases have been kept in separate bags, and allowed to combine just before issuing from the burner. In many cases they do not mix inside at all, the oxygen and hydrogen uniting *outside* of the burner. In such a case an explosion is quite impossible. It does not, however, require the aid of the photometer to discover that, when the gases are mixed previous to their emission, the light is much purer and more intense than when the other and safer form of burner is used.

In what follows I shall assume that if the best possible light be desired, the oxygen and hydrogen must be brought into contact previous to their emission from the burner.

If the gases are mixed only inside of the jet, no supply of it being kept in store, where, it may be asked, lies the danger of an explosion, or, at any rate, one of any magni-

* Read at a meeting of the South London Photographic Society, February 13, 1868.

tude, seeing the explosive material is so small? There are various sources of danger, such as the accidental presence of some other gases than hydrogen or oxygen in their respective bags. If the gases be pure, and kept separate and under uniform pressure, I do not believe an accident will occur; I have not, at all events, heard of any. But if the weights on the bags be not equally adjusted, the bag which is under the greatest amount of pressure has a tendency to transmit its gas to the other, unless the orifice be sufficiently large to allow both gases to escape into the atmosphere. Should, however, the orifice be stopped by a particle of dirt, or by any other means, diffusion of the gases will take place with alarming rapidity. That it does so repeatedly, even under the most favorable circumstances, is attested by the frequent snappings in a mixed gas burner.

The interposition of several layers of wire gauze is supposed to prove a preventive measure. It is argued that, as a common flame will not pass through a small orifice, so neither will the flame of oxyhydrogen gas. There is a considerable difference between both the nature and tenacity of certain flames. Sir Humphrey Davy found that a wire tissue of one hundred apertures to the inch (made of 1-60th size wire) will intercept the flame of a spirit lamp, but not that of ordinary hydrogen, although both these flames have been considered to be very similar in their tenacity. I am almost prepared to assert that the flame of oxyhydrogen will pass through any body that will transmit the gas in a practicable quantity. Mr. Gurney has sent the oxyhydrogen flame through a thin slab of plaster of Paris, and I have myself sent it both through porous wood and a wire-packed tube; hence I conclude that safety must be sought for in some other direction than in the interposing of obstacles which assuredly would prove futile in resisting the passage of the flame.

Where, then, is safety to be sought for, and by what means is it to be secured? The following principle will enable us to arrive at a satisfactory reply to this question:—If the orifice of the burner be small, and the gas from one reservoir be not allowed to get into the other, no explosion can take place in either bag. The small snapping explosions in the burner are innocuous; I refer especially to the explosion of the bag, which, if of large capacity, will readily unroof a house and scatter destruction all around. Mr. Gurney found the only means of security to consist in passing the gases through water. I have tried this, and, although satisfactory for blow-pipe experiments, it is not so for lighting purposes.

On the occasion of a life very valuable to science being nearly sacrificed by an explosion, I was requested to devise a burner by which an explosion would be rendered impossible either by carelessness or design. In endeavouring to accomplish this I found only one thing to be necessary, viz., that the gas pipe from the bag to the burner should transmit the gas in one direction only; that to secure this one or more self-acting valves must be interposed in the current of the gas, and that these should only allow the gas to pass when under pressure, when, consequently, no danger could result. For instance: suppose that the weight accidentally falls from off the hydrogen bag, the sudden release of the bag from pressure causes not only the cessation of the gas supply, but also a back-draw, which, were there mixed gases in the bag, would be instantaneously followed by an explosion. But the hydrogen being pure, nothing happens at first beyond the going out of the light. Simultaneous with this, however, the oxygen rushes into the hydrogen bag, which is now relieved from pressure, and, on the subsequent application of the flame, the bag is in a favourable condition to explode.

If there were a self-acting valve, such as that to which I now direct attention, nothing whatever could happen but the extinction of the light; for concurrently with the withdrawal of the pressure caused by the weight falling off the bag, the valve would close, and the greater the back-draw into the bag the more certainly would the valve act to pre-

vent it. But, moreover, for the gas from the one bag to get access to the other would be a simple impossibility.

This method of thoroughly preventing an explosion is not a mere crude suggestion. I have had it in use for some years. After I determined upon adopting valves of this description I had some made, and I tried their efficiency in every possible way. In order to subject them to a crucial test I had a small bag (full of the mixed gases) so constructed that, when the flame was issuing from the burner and everything was ready, by pulling a string I could at once remove the pressure, and cause the bag to suck air in as if it were a bellows opening, and that, too, with a burner and tubes quite unobstructed by any kind of packing.

I shall now show, by means of diagrams, some of the several kinds of safety-valves I have had in use. I have varied their forms to suit the particular circumstances under which I employ them, but the principle is the same in each, viz., a light flap or valve of any light, unoxidizable substance, such as aluminium, kept, either by the force of gravity or by a light spring, against a plate of metal having a hole sufficiently large to transmit the gas, which it will do in one direction only, by its elastic force raising the valve, and thus permitting its egress. When, on the one hand, the pressure on the bag is withdrawn, or, on the other, a greater degree of pressure is exerted outside of the valve, it immediately closes; and, as I have already stated, the greater this opposing pressure the tighter is the valve closed, and the more impossible is it for an explosion to take place.

As it is impossible to show the action of these valves when prepared for actual service, Mr. F. W. Hart has kindly prepared some models in glass, and, by means of the small elastic bag attached, the action of each valve respectively will be seen, and the perfect safety of the system demonstrated.

These valves cost only a trifling sum, they occupy little space, can be attached to all existing burners, and, on these grounds, coupled with the safety secured by their use, I recommend their adoption. One of them placed inside the tube near the bag, and one at the stopcock at the back of the lantern where the elastic tubing is attached to the burner, will prove a sufficient protection for each bag.

CONCENTRATION OF LIGHT IN THE STUDIO.

BY E. DUNMORE.*

It is a popular idea that Continental photography owes much to the excellence of the light, altogether independent of the skill of the operator. I have brought this evening for your inspection a few pictures, taken under very disadvantageous circumstances, both of light and temperature, during the past month, exemplifying that the *purity* of the light is not a *sine qua non* for the production of a brilliant photograph. The exposure, which ought in a good light to have been about a minute, has been never less than two, and in one or two cases over four minutes. The time for printing has been from one to three days each print. I do not exhibit them as "uncorrected" photographs; for I believe no large portrait was ever made that could not have some touches advantageously added to soften a hard line or sharpen a soft one. Where this could be done I have had it done, and am a firm believer in its perfect legitimacy. The negatives were taken with the smallest amount of diffused light in the glass house possible to work with, the models being lighted by about a yard square of clear glass, some even with less. Had it been bright summer weather, of course less clear glass would have sufficed with advantage even than this.

INFRINGEMENT OF COPYRIGHT BY PHOTOGRAPHY.

WE find details in the daily papers of a case of extensive infringement of copyrights by means of photography, in which fines to the extent of £130, being £5 each for twenty-

* Read before the London Photographic Society, February 11th, 1868.

six separate piracies, were inflicted. The case was heard at Guildhall Police Court, before Sir Robert W. Carden, on Monday last.

Samuel Benoni Beal, a stationer and dealer in photographs, carrying on business at 47, St. Paul's Churchyard, appeared before Sir Robert W. Carden, to answer thirty-four summonses taken out against him by Mr. Henry Graves, of Pall Mall, the eminent publisher and engraver to the Queen, for unlawfully selling, on the 31st of July last, seven pirated photographs of a painting called "Ordered on Foreign Service," four of "My First Sermon," and two of "My Second Sermon," knowing the same to have been unlawfully obtained; and for unlawfully and fraudulently selling one photograph of "His Only Pair," having thereon the name of the complainant, who did not execute or make such photograph. Also for unlawfully selling, on the 12th of August last, seven copies of "Ordered on Foreign Service," four of "My First Sermon," and two of "My Second Sermon," knowing the same to be unlawfully made; and likewise for unlawfully and fraudulently selling three photographs of "His Only Pair," two of "The Plough," one of "Saved," and one of "Taming the Shrew," having thereon the name of the complainant, who did not execute or make such photograph.

Mr. George Lewis, jun., of Ely Place, appeared for the complainant (Mr. Graves), and Mr. Francis for the defendant.

Mr. Lewis, in opening the case, said there were thirty-four summonses against the defendant, but he would take them as under two heads, as there were only two purchases. In this instance there was no excuse for the defendant, for he was well acquainted with the photographic law, and had actually started, in conjunction with Mr. Ashford, an association for the purpose of protecting the photographic process of pirating works of art against the attempts which the owners of registered copyrights might make to prevent them carrying on their lucrative trade. Their names were attached to the pamphlet advocating the society, and they had been receiving subscriptions for the purpose of protecting themselves under the shadow of that society. Mr. Lewis then explained the case as given in evidence, and said that to detect the defendant and others it had cost Mr. Graves over £1,000. One of Mr. Graves's engravings had cost him £25,000, and before he could get the copies round to the subscribers the photographs of it were being sold for 2s. 6d. each, and it laid Mr. Graves open to the remark that what he was selling for £10 10s. others were selling for 2s. 6d.

John Cattermole, in Mr. Graves's employ, proved the purchase at defendant's place of business of four copies of the "My First Sermon," seven of "Ordered on Foreign Service," two of "My Second Sermon," and one of "His Only Pair."

The engraving of "My First Sermon" was put in, and Mr. Graves said that he paid £1,000 for the copyright of that engraving, and the photographs were selling for 2s. 6d.

Mr. Cattermole said he went to the defendant's on the 12th of August for a parcel, and it was made up for him at the back of the shop. He paid defendant £5 8s. for it, and received a bill and receipt for it. That parcel contained seven copies of "Ordered on Foreign Service" (the original picture of which was burnt at the fire at Mr. Graves's when the Italian Opera House was burnt down), four of "My First Sermon," two of "My Second Sermon," three of "His Only Pair," one of "Saved," two of "The Plough," and one of "Taming the Shrew." They all bore the name of Mr. Graves and the names of the painter and engraver. He received the following letter from Mr. Beal, which he wanted him to sign:—"I hereby signify, for your satisfaction, that the goods purchased by me of you at various times are your own stock, and not those copyright pictures which I am buying elsewhere. This is signed, at your request, to avoid any complication in the future from any dealing in and buying pictures you do not sell on copyright grounds." On the 5th of February he wrote agreeing to sign the document, and ordering more goods, and, on the 6th, received a note from the defendant agreeing to sell more, but asking, "How about the parcel already looked out?" Several letters passed between them, and in one, on the 15th of February, defendant said: "Possibly I might get, on your sudden demand, any quantity enough for you by a little notice. The great thing is reliability."

Mr. Graves proved the registration of the various pictures, and stated that he gave 200 guineas for the copyright of "Ordered on Foreign Service," and the engraving cost 200 guineas more. The various photographs were not made by him nor by his order. If that piracy were allowed to go on it would ruin engraving for the next half century.

Mr. Lewis asked for thirty-four penalties of £5 each, or in default two months' imprisonment on each fine.

Mr. Francis contended that it rather benefitted than injured Mr. Graves to have his pictures photographed, as it was an advertisement for him. He, however, submitted that the Act would not apply to "His Only Pair," "The Plough," and "Saved," as they bore date before the Act under which they were proceeding was passed. The photographs did not purport to be published by Mr. Graves, but to be a copy of an engraving published by Mr. Graves. He then took exception to the certificate of registration, as it did not contain a description of the picture, and was, therefore, not in accordance with

the Act of Parliament. He next contended that the defendant was summoned for selling a photograph of the painting, whereas the evidence showed that it was a photograph of the engraving. He then came to the question of penalties, and said that only two sales had been proved, and that, therefore, only two offences had been committed, for which he had the power to fine the defendant £10 each; but he denied that the magistrate had power to make thirty-four offences of them.

Mr. Lewis contended that the sale of every photograph was a separate offence. As to the photographs being taken from the engravings, the Act was passed expressly to meet that case, for it was well known that they could not get at the pictures to photograph them. With regard to the certificate, it stood as *prima facie* evidence until it was rebutted.

After a lengthened argument between Mr. Francis and Mr. Lewis, Sir Robert W. Carden said he would adjourn the case, and give his decision the next morning.

On Tuesday morning, on the opening of the Court,

Sir Robert W. Carden said: I am very glad I delayed giving judgment yesterday, for it has given me an opportunity to weigh well all the arguments which were used by the learned counsel for the defence. I am certainly in some little difficulty with regard to eight of the summonses. The complaint is, "did unlawfully sell a photograph, to wit 'The Plough,' having thereon the name of the complainant, who did not execute or make such photograph." Now it appears to me that that wording is so ambiguous that I should not like, unless Mr. Lewis can relieve me from the difficulty, to convict upon those eight. If it had said, "having thereon the name of a person who did not execute or make such photograph," I think it would have had more weight; but as it is at present I should not like to take upon myself the responsibility of convicting upon those eight. Now there is no doubt that a great and cruel fraud has been committed upon the prosecutor, Mr. Graves, by the mean and dishonourable system of piracy which exists, and has existed for some time, to so ruinous an extent that, if not checked, it would inevitably lead to the destruction of the beautiful art of engraving. The learned counsel, Mr. Francis, has spoken of the great value of photographs, and everybody must have been struck with the beauty of the specimens submitted to us yesterday; but in proportion to the value of the production we must give protection to the holder of the original design. We know that there is great profit arising and great danger in obtaining that profit by the sale of these articles, and it is most difficult to ascertain the wholesale agent who remits them to the retailers. I have been looking into the evidence, and fairly weighing the ingenious arguments of the learned counsel. Mr. Beal, curiously enough, has actually inaugurated a society for (as it appears to me) the protection of himself from the pains and penalties of doing wrong, and he will no doubt repay himself from the funds of that society. I did not read the book last night, but certainly the preamble was most extraordinary, and appears to be for the protection of fraud. No doubt it is very difficult to prevent the importation of foreign photographs, because there are always dishonest men, with no character, willing to traffic in anything if they can make money by it; but do not let it be said that such practices are pursued by men who are regarded by their neighbours as respectable and fair-dealing tradesmen. One would hardly suppose that it could be so. I do not think it is fair for one man to live upon the brains of another. We all live by our own brains, and I think we ought to be well paid for the work of our imagination. Therefore I think it a very hard case that one gentleman should be so robbed by another. I call those houses which receive these photographs as no better than the receivers of stolen goods, and this they must know perfectly well; and Mr. Beal must have known it perfectly well, as is proved by the secrecy which is observed in selling, and also by his being under the protection of the society. Under these circumstances I shall take off the eight cases, reducing the number to twenty-six; but in each of these I inflict a fine of £5, or, in default, seven days' imprisonment, which will amount to £130, or six months' imprisonment. I hope this will be a warning to all those who endeavour, by the advantages belonging to art and science, to encroach on the property of other people.

Mr. Francis asked for a case for a superior court on three grounds: first, that there was a defect in the registration; secondly, that there was no evidence that the photographs were copies of the pictures or the design thereof; and, thirdly, that the magistrate had no power to fine on every individual photograph.

Mr. Lewis replied; and, after a very animated discussion,

Sir Robert W. Carden said he thought the objections were frivolous, and refused to grant a case.

The defendant then paid the fines under protest, so that he might apply to a judge at chambers on those points.

Proceedings of Societies.

FRENCH PHOTOGRAPHIC SOCIETY.

THE January meeting of the Society was held on the 17th ult., M. BALARD occupying the chair.

M. DAVANNE, on behalf of the Administrative Committee, notified to the members the loss they had sustained by the death of the Duc de Luynes, who had been one of the founders of the Society, and likewise one of its most ardent supporters. He stated that a letter of condolence had been drawn up in the name of the Society, and transmitted to the late Duc's grandson, who had received the note with much regret.

M. DAVANNE also announced the death of M. Claudet, who was one of the earliest photographers; he was among the first to engage in the study of Daguerreotype, and to put that process into practice; and he had, during his lifetime, contributed to the art many important improvements.

A letter was read from Sir David Brewster, thanking the Society for the honour they had conferred upon him by awarding the medal of the Society for his researches, and forwarding for the acceptance of the members two copies of his works on the stereoscope and kaleidoscope.

M. DAVANNE announced that, in consequence of domestic affliction, their esteemed President, M. Regnault, would not offer himself again for re-election. M. Regnault had been President of the Society for the last thirteen years, and, as a token of respect to one who had devoted so much of his time and labour to their welfare, the Administrative Committee proposed that he should henceforth be styled Honorary President to the Society.

This proposition having been unanimously agreed to, M. Davanne read the Report of the Committee appointed for the distribution of awards to deserving photographers during the year 1866. The Report stated that the year in question had been very unfruitful in regard to the discovery of new processes, many photographers doubtless being unwilling to bring forward their improvements pending the duration of the Exhibition. Several names had been considered as to their claims to receive the Society's medal on the score of the superior excellence of their productions; but as these gentlemen did not impart their method of working to others, and as it was the principal aim of the Society to encourage the vulgarisation of the art; no appropriation of medals was recommended.

M. BRAUN presented the Society with ten albums containing photographs in pigments of works of art in the Vienna and Weimar galleries.

M. DESPAQUIS exhibited some carbon prints taken upon paper coated with a collodion varnish.

M. BRIORS exhibited to the Society samples of the coloured and uncoloured collodion varnish.

M. DRIVER presented to the Society a collection of photo-engraving, produced by a process of which he has not yet published the details.

M. CURMER described to the Society the details of a small portable laboratory, invented by himself, which, by simplifying the manipulations and economising the apparatus employed, he has been able to reduce within the most limited dimensions. He presented a model to the Society.

The proceedings then terminated.

Correspondence.

M. SALOMON'S PORTRAITS.

SIR,—Although the controversy as to the source of superiority in M. Salomon's pictures has already occupied more than a reasonable amount of public attention, there still remain some questions which should, I think, be answered.

1. Has M. Salomon ever said that all his pictures were untouched?

2. Has any competent authority said his pictures were all untouched, or, as a rule, untouched? I ask this question because I see that a correspondent in the *British* of Jan. 31, signing "Scrutator," affirms that you have made such statements; and as I have only recently commenced taking the News, and in the numbers I have read I find that you constantly affirm that many of the pictures are touched, I am curious to know the cause of the discrepancy. "Scrutator" refers to pages 481, 534, and 545 of the News, as containing statements that these pictures are untouched. The first passage is quoted, and it distinctly states that M. Salomon's portraits are untouched.

3. Has any one, whose word or judgment would carry weight

with photographers, seen the print which "Scrutator" says he analysed; or is there any evidence, beyond an equivocally worded anonymous letter, to prove that any such examination was made?

4. If it be true that such examination was made, and that one print was found to be touched, does it follow that all were touched?

5. Has any one else produced similar results by means of touching?

6. What is touching? This question seems absurd; but the word seems of doubtful meaning. In its ordinary sense it is understood to be applying a few touches to remove defects or produce improvement, and all photographers are supposed to do it. Young ladies for touching and mounting are in frequent requisition. But when used in reference to M. Salomon's prints it seems generally to imply what used to be understood by "working up" or covering the photograph with sepia or Indian ink.—Yours truly,

VERITAS.

[We will answer our correspondent's questions categorically, although we think that it should scarcely be necessary to answer any of them. 1. We have repeatedly stated that M. Salomon has not put forth any statement or question of touching at all. 2. We have from the first very distinctly stated that some were a little touched, some considerably touched, and some untouched; also that the best were untouched, and that the characteristic excellence was in nowise due to touching. We have constantly repeated this statement as to the touching, and have never said anything which, even by implication, could be understood as a statement that all the portraits were untouched. We have turned to the pages of the News to which you say "Scrutator" refers as containing statements that the pictures are untouched, and find that he has been guilty of something very like dishonesty. The passage quoted as from the News, p. 481, is, in reality, from the *Times*; it is quoted in the News at that page, and duly accredited to the *Times* Correspondent. The other two references are to our own articles, and contain no such statement. They contain allusions to special pictures which we had ascertained to be untouched. 3. We have not heard of any one who has seen the "analysed" print. 4. Of course not, any more than because one print has been found to be untouched that all should be considered so. 5. We have not heard of any one who has produced similar results by touching or any of the proposed "dodges." 6. By "touching," we presume is meant the removal of blemishes or supplying of deficiencies, which can be effected without interfering with the distinctive photographic characteristics of the photograph, a process which most careful photographers apply to such extent as they can to pictures. "Working up" is rather a mode of finishing, in which the photograph is made the basis of monochrome painting.—Ed.]

SILVER PRINTING.

DEAR SIR,—It is with much gratification that I notice Mr. Bovey has undertaken to write a few practical articles on the subject of printing. How important the process, and yet how few really possess that practical knowledge that is indispensable to success! Many, of late years, have entered photography, and with one stride rushed into the operating room, thinking all other departments of very minor importance, consoling themselves with the idea that a boy, or even a young girl, at a few shillings per week, can be trusted to undertake the printing, toning, &c.; and if any failure occurs it is either the bad paper, impure gold, hard water, or all together, that are blamed, and, as usual, all are brought in guilty except the real defaulter.

Again, how many are allowed to conduct these processes who go to work in a most mechanical way, treating all negatives alike, as well as all papers, whether strongly salted or not! During the last ten years I have heard it frequently remarked by operators of experience, when asked why they always take such hard negatives, and, as a rule, considerably over-intensify them, their answer has been, Because the printing is done by young, inexperienced hands; and that unless the negatives are so thick with deposit in the lights that it is almost impossible to over-print them, they are sure to be spoilt. No one can become doctor of law, science, or medicine, without first thoroughly accomplishing the preliminary stages to that degree; and no one should consider himself a photographer when he alone understands the process of taking negatives.

But those that are in this unfortunate position have a remedy,

which they would do well to avail themselves of, as it would put money into their pockets as well as advance their reputation. The remedy I refer to is simply this: Put your printing out. In these days, when there are men of recognized ability who undertake printing for the profession, and can always ensure the same good, uniform results, through working (like our friend Mr. McLachlan) upon principles based on experience, should be the means of supplying the lack of that knowledge so evidently wanted in many who call themselves photographers, and who are either too proud to own their inexperience in this department, or fancy it too expensive to put their printing out, which latter is a great fallacy, inasmuch as if they reckoned up what their failures cost them, and the inevitable result of sending out inferior work, they would come to the conclusion that they would be in pocket by availing themselves of this remedy.

I would mention here, in support of this, that I was much pleased the other day with the frankness of a letter addressed to a trade printer of great experience from a photographer in the country. He stated that he had a fair knowledge of operating, and could take good negatives; but, knowing nothing of printing, would feel obliged if — would undertake the same for him regularly. To own one's ignorance is wise, and will in the end bring its reward. One has only to take a cursory glance at the albums found upon the drawing-room tables of this vast city to see how much still remains to be accomplished before photography can hold a position among the arts that it should be the desire of every photographer to make for it. The bad style that many have of vignetting is certainly inexcusable after all that has been said and written on this subject; however, these faults and failings are not, as a rule, to be attributed to those who have taken up with photography as an art, but to those who have simply entered into it as a trade; and the sooner they quit what should be a profession, and not a trade, the better for real photographers and the better for art generally.

Thanking Mr. Bovey for taking up the subject in a practical form in your valuable pages, I remain, yours very truly,

GEORGE HOOPER.

Talk in the Studio.

DEVELOPMENT EXHIBITED BY THE MAGIC LANTERN.—A pretty lecture experiment was exhibited, on Friday evening, at the Royal Institution, by Professor Roscoe, in which the process of developing a latent image was shown to an audience on the screen of a magic lantern. A wet plate having been exposed to the light of magnesium wire, under a negative, and a latent image produced, the prepared plate was then placed in the groove of a magic lantern, a red glass being interposed between it and the light. The developing solution being then applied to the film containing the latent image, the gradual appearance of the visible image, as development progressed, was seen by the whole audience, as projected on the screen. When completed, and the red glass was withdrawn, the transparency being illuminated with the brilliant oxyhydrogen light, the effect of an image which had its birth under their eyes had a very striking effect on the audience. We presume that the operation of development would be effected by immersing the prepared and exposed plate in a suitable glass dipping-bath containing the solution, and then placing the whole *in situ* in the lantern.

SPLITTING OF FILMS.—Mr. T. Stothard sends us the following regarding the splitting of films:—"I beg to state the result of some observations on this subject. I had been troubled with scratched splitting of the film, and, considerably annoyed, sought for the cause. I found that negatives taken on the same day, and under similar circumstances were not all damaged. Those with a portion of the film removed all round for neatness and security (?) before varnishing, had gone in some cases; of those varnished with the same varnish (Thomas's), but not cleared at the edges, fewer; and, on looking through my several boxes of negatives taken during the last two years, I found that none had gone of those not varnished, but coated with a preservative albumen solution, the receipt for which I am indebted to Dr. Holden, of Glenarm, N. Ireland:—

Albumen	...	...	...	white of 2 eggs
Water	...	...	...	1 ounce
Liquid amm. fortis	...	...	...	15 minims,

filtered through cotton-wool, poured on to the plate after it is fixed and washed, and while still wet. *Advantages:* it sinks into and supports the film; is of no appreciable thickness, and the negative therefore is in closer contact with sensitive paper while printing; and, as I find, freedom from cracking."

THE FORTHCOMING SOLAR ECLIPSE.—At the anniversary meeting of the Astronomical Society, on the 14th inst., the Rev. C. Pritchard, President, made the following statement:—"The present year will be signalized by a total solar eclipse of almost the greatest possible duration. As probably centuries may elapse before we shall have again an opportunity so unexceptionably favourable for observing the peculiar phenomena which are only to be seen during a total eclipse of the sun, it will be a source of gratification to the Fellows of the Society that two well equipped expeditions have already proceeded to India for the purpose of making observations during the eclipse of August next. One of these expeditions, originated by our Society, is under the superintendence of Major Tennant, of the Great Trigonometrical Survey, who will be assisted by Captain Brandreth and three non-commissioned officers of the Royal Engineers. It is proposed to take photographs of the eclipse, for which a reflecting telescope of the Newtonian form of construction, furnished with a silvered glass mirror, has been provided. The pictures will be taken at the focus of the mirror, without any enlargement, by an eyepiece; as was the case with those taken by Mr. Warren De la Rue in Spain. Major Tennant is also provided with suitable apparatus for observing the spectra of the red prominences and of the corona, and for analyzing the light of these objects by polarization.

THE PHOTO-GALVANOMETER.—A paper was recently brought before the Royal Society by Professor Airy, on earth currents. Currents of electricity are always running to and fro in the earth, sometimes entering the telegraphic wires, and sending streams of electricity through the lines of sufficient strength to overpower the working batteries, to stop telegraphic news for the papers, and to send unreadable messages on their own account. Such electrical storms are a source of great loss to telegraph companies while they last. A few miles of wire were, therefore, erected from Greenwich Observatory, to measure and observe these currents, which are made to move a galvanometer to and fro ere they enter the earth. The galvanometer is mounted in a darkened room, and its needle reflects a ray of light as it moves upon a sheet of photographic paper, whereby variations in the current are continuously recorded. Professor Airy's paper, read before the Royal Society, pointed out that some connection exists between the movements of the earth currents and the declination magnetometer, for both are affected at nearly the same time.

PHOTOGRAPHS OF THE BELGIAN VOLUNTEERS.—The civic guards of Liege, following the example of their Antwerp brethren, have resolved to present Miss Burlett Coutts with their photographs, enclosed in a beautifully bound ornamented album.

PHOTOGRAPHY AT THE AMERICAN PATENT OFFICE.—In the annual report just issued from the Patent Office at Washington it is stated that henceforth photography will be used for reproducing and multiplying the designs of patented articles. The Reporter says:—"The drawings now number over 100,000, and are becoming torn and soiled by the constant but legitimate wear to which they are exposed. Photography seems to offer the only means for renewing them. For some time past I have had it in contemplation to have photographic copies of uniform size made from the current issues and the drawings of former patents, so as to furnish to each examiner a copy of all drawings appertaining to his class, enabling him to consult them without going to the draughtsman's room, where the space is insufficient for the purpose. It has been my purpose to commence by photographing each week the current issues and several hundreds of the back issues, so as gradually to accumulate a full copy of the record, and, where a drawing may be lost, to take a photographic view of the model which might stand in its place. The copies thus made would be of even size, and smaller than the average of the originals, which would enable them to be placed in compact form, and greatly to economize the room occupied by them."

SEDUCTION IN A PHOTOGRAPHIC STUDIO.—A case was heard in Court a few days ago—one of a class, happily, not common in photography—in which a photographer residing at Mile End was the defendant in an action for seducing a young lady who was assistant in the reception-room. The Court awarded £250 damages.

To Correspondents.

ENQUIRER.—The card enclosed undoubtedly contains hypo, or some compound yielding sulphur, causing fading of the print; we should scarcely have been prepared, however, for such a deplorable amount of fading and discolouration from such a cause as the card exhibits. It appears, however, very probable that the deplorable condition of the picture is due to the presence of the hypo. 2. The cracking in the negative film, of which you send us an example, is curious and of a kind not common, although we have seen a similar case before. The varnish appears quite intact, whilst the film of collodion is clearly divided. We cannot satisfactorily explain the cause.

J. L.—You must go to more authentic and trustworthy sources for information before you base arguments thereon. The "fact" that M. Adam-Salomon did not receive medallistic honours at the French Exhibition, or that it was because he admitted that his photographs were touched, is not a fact, but a fabrication. M. Salomon received a silver medal for his photographs at the Exhibition; and he was not asked any questions by the jurors as to the touching, nor made admissions of one kind or another. The extent to which any of them is touched is, in most cases, easy enough to distinguish, and neither requires admission or denial, as it in no wise affects the peculiar excellence of his pictures; nor does the question of touching affect the lesson which photographers should derive from them. You must not run away with the notion that the sketches in question give the slightest idea of the pictures; their real charm—which consists chiefly in the grand masses of light and shade—is entirely lacking. You must see the prints themselves to form an idea.

ALCOHOL.—Methylated spirit and methylated ether are frequently used by manufacturers of collodion. Redistillation is the only effectual method of rectifying spirits. By keeping it in a bladder, water passes through the membranous bag, leaving the spirit behind, and so strengthens it by evaporation of the water; but this is not practical upon any large scale.

A SUBSCRIBER.—Refer to our advertising pages, and after selecting such as appear likely to suit you, indicate them in your next by a figure or letter; we can then advise you without making invidious distinctions.

T. STOTHARD.—A varnish of which the chief ingredient is boiled oil will make calico waterproof, and also transparent; but all such materials for making fabrics waterproof eventually become yellow. Thanks for the hint, which we give in another column.

J. A.—White blinds will, of course, answer a similar purpose to stippling the glass. We approve your resolution, and hope you will have success. 2. Your doublet or portrait lens will answer best for enlarging and copying.

W. J. A. G.—It was curious enough that you should get any presentable result in such a mode of operating; but, as you remark, the prints would not possess value for practical purposes. The possibility of performing the ordinary dark-room operations in the presence of any proportion of actinic light depends, of course, for immunity from injury, partly on the sensitiveness of the plate, and partly on the rapidity with which the operations are performed. Your letter did not contain the example of a fabric for dark tent, concerning which you make inquiry.

A PROVINCIAL PHOTOGRAPHER.—To begin with, the focus of your condenser—eight inches—is much too long for convenient use in enlarging with artificial light; one with a focus half that length will answer better. The artificial light should be placed at a distance from the condenser a little less than its solar focus, and the focus of the condenser, bringing the light to a point, should be on the front lens of the combination used for enlarging. The condenser must be larger than the negative to be copied, and the negative should be sufficiently near the condenser to get perfect illumination all over. The further from the condenser it is placed the smaller will be the portion of it illuminated, as, of course, the cone of rays diminishes in diameter as it leaves the condenser.

C. W. S.—The unequal development of your enlarged prints is due to unequal dryness of the print when the developing solution is applied. In the formula which you quote it is intended that the paper should be used wet, in which case you would have no inequality. 2. The formula in question is suitable for development, but not for printing out. In the production of enlargements printed fully out, without development, you cannot do better than use the ordinary albuminized paper printing process, and tone in the regular way. The only modification which enlarging renders desirable is the use of a more highly salted albuminized paper and stronger silver bath than usual, in order to secure greater sensitiveness.

WATERLOO.—As a general rule, the transparent positives neces-

sary for producing enlarged negatives do not need intensifying, as great density is not required, but rather softness and fullness of detail. We cannot tell you the reason why your positives are weak without seeing them, or knowing something of the means whereby they are produced.

TONY.—You will find a useful article on the Positive Collodion Process in our YEAR-BOOK for 1864. 2. Bottles which have had solutions of silver or gold may be cleansed with strong cyanide of potassium; those which have contained iron solutions with sulphuric acid; those which have had collodion with ether and alcohol.

J. C. D.—The general proportions of your proposed studio are very good; but it would be better a foot higher at the eaves and one or two higher at the ridge. 2. For the dark room, a skylight is quite inadmissible; you must have the light from a window in front of you, in order, with convenience, to examine the progress of development in producing negatives.

R. J.—Theoretically, the back lens of the triplet for enlarging should be placed next the screen, and the front lens next the light; in practice we believe that it does not much matter. 2. It is better to place the negative in a frame, which will intercept all light not passing through it. 3. It is important that the focus of the condenser should fall on the front lens—that is, the lens next the screen—of the enlarging lens. 4. If you use a solar camera for producing enlarged negatives, use the condenser if you have sunlight, and the exposure will be exceedingly short. If there be no sunlight the condenser is useless. 5. For producing enlargements on paper, by means of the solar camera, using the paper wet from the sensitizing bath is the best plan. As a rule, with sunlight the exposure will be decidedly shorter than with artificial light, using the same process. 6. Of course you must focus by the lens. The negative must be in such a relation to the condenser as to be imperfectly illuminated. If it be too far off the diameter of the cone of rays will be insufficient to illuminate the negative all over; if too close to the condenser, intensity of illumination is lost. The best position is that where the diameter of the cone of rays just covers the negative. A compilation from our pages of the material to which you refer would doubtless be useful to many; but it is uncertain that its publication would be remunerative. It may possibly be done, however.

T. C. (Brixton).—With the exception of Col. Sir H. James's book there is no work published on photozincography or photolithography. The best definite information you can obtain will be found in Mr. Baker's article in our YEAR-BOOK for 1867. Col. James's book is published by Longman and Co.; the price is 12s. 6d.; it is a good book, but does not enter into minute technical details or manipulations.

W. BONEHILL.—The photograph from painting of a prize ox was duly registered.

AMATEUR, A. W.—It is a somewhat difficult matter to advise you upon, as the best professional photographers are generally indisposed to be troubled with pupils, and those willing to receive them are not always the most capable. There are, however, exceptions. We will make some enquiry and let you know privately.

AMATEUR (Pau).—We suggested that the plates might have been used before, because the lines seemed much like the result of lines of a former image imperfectly removed from the plate. The suggestion you make as to the constant moving of the plate up and down from the moment of immersion, and the possibility that the plate might not be perfectly immersed each time, will, we think, readily account for the lines, which, if we understand rightly, were not in the direction of the dip, but at right angles to it. As a pause in the immersion of the plate will cause a line, so repeated imperfect immersions immediately after the first immersion would produce a series of lines. We shall be glad to hear any further details.

RECEIVED: Dr. Liesegang's "Der Photographische Kohle-Druck," and "Abridgments of Specifications Relating to Photography," Part II., 1860-65.

Several Correspondents in our next. Several Articles are again compelled to stand over.

Photographs Registered.

Mr. HORTON, Preston Rectory, Wellington,
Photograph of Maphoon.
Photograph of Maphoon's Eldest Son.
Photograph of Maphoon's Youngest Son.

Messrs. POOLE AND HIND, Bradford,
Eleven Photographs of Mr. and Mrs. Joshua Poole.
Mr. M. APPLETON, Bradford,
Lithograph of Rev. W. M. Punshon.

Messrs. DOWNEY, Newcastle-on-Tyne,
Photograph of the Bishop of Tennessee.
Photograph of the Rev. C. Moody.
Photograph of the Rev. J. M. Bellow.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
Permanganate for Rectifying Old Baths.....	102	More Photographic Piracy of Engravings.....	116
The Carbon Process, not Braun's	110	Proceedings of Societies—Oldham Photographic Society	117
Visits to Noteworthy Studios	110	Correspondence—"Photography and Disease"—Health <i>versus</i>	
Echoes of the Month. By an Old Photographer.....	112	Chemicals—Common Water for Nitrate Bath: Permangan-	
Pictorial Effect in Photography. By H. P. Robinson.....	113	ate of Potash	117
Printing by Development	114	Talk in the Studio	119
On Certain Phenomena observed in the Photographic Image.		To Correspondents.....	120
By M. l'Abbe Laborde	115		

PERMANGANATE FOR RECTIFYING OLD BATHS.

FROM various communications which have reached us it appears probable that the use of a permanganate for rectifying old nitrate baths containing injurious organic matter will become common, as it is, in the various cases brought under our notice, successful. A few further observations on the best mode of proceeding seem, however, to be desirable, to aid experimentalists in securing the best result. One of the chief errors to be avoided is adding excess of the permanganate, through impatience to secure a speedy effect. If the permanganate be added cautiously and in small quantities, the organic matter, especially the most injurious part of it present, will be oxidized and destroyed; and no further result will take place. But if excess of permanganate be added, and especially in strong solution, permanganate of silver will be formed, and as this is soluble in water to the extent of about four grains to the ounce, a portion will remain in solution. The precise action of this salt in the bath remains to be ascertained; but it is probable that it will be analogous to that of nitric acid. But another danger may, possibly, arise from its presence: the oversaturation of the bath with a comparatively insoluble salt generally induces a tendency in such salt to crystallize out, and so become a source of pinholes in the negative. Permanganate of silver is formed in the shape of fine needle-shaped crystals of a bronze colour when strong solutions of nitrate of silver and permanganate of potash are mixed. We have heard of one case in which pinholes followed the addition of permanganate of potash to a bath; and this, there is little doubt, was due to formation of the minute crystals in question. Dilution and filtration of the solution effected a cure.

We remarked, above, that the injurious portion of the organic matter present in a bath would be first removed by the action of a permanganate. This may require explaining to some of our readers. The ether and alcohol which accumulate in a nitrate bath are comparatively, if not entirely, innocuous whilst they remain in the bath without change; but they generally give rise to the formation of aldehyde and similar bodies, which have reducing action on salts of silver, and so induce fog; and it is with these substances that the first reaction of the permanganate will take place, and if only sufficient be added to effect their oxidation the tendency to fog will be removed, and no further change effected.

The following letter, one of several recording successful results which we have received, suggests one or two further comments which may be useful:—

"DEAR SIR,—I have experimented with the permanganate of potash, as suggested by Mr. Johnson and yourself in last Friday's NEWS.

"I had about 60 ounces of very old bath, which I was awaiting an opportunity of boiling down, having tried nearly all other known remedies—such as rendering neutral and sunning, adding cyanide and sunning, boiling, &c.—but to no permanent use.

"I procured the dark purple crystals, and dissolved 20 grains in one ounce of distilled water, and added the whole to my bath gradually, shaking well between each addition. The solution rapidly assumed the colour of clay, very difficult to see how things were going on. So I determined to filter, and, finding it still smell very strong of alcohol, or old rum, I determined to add, gradually (the colour of the bath again becoming very dense), until all smell had disappeared, which required 30 grains more in 1½ ounces of water; again filtered. The deposit this time was of a very deep chocolate colour. I then weighed with the meter, and found it had dropped from 40 to 36 grains; and being slightly acid to litmus paper, I neutralized with a 10-grain solution of caustic potassa, and then added a few drops of dilute nitric acid. I then tried a plate, and found it a complete success; how long it will remain so has to be tried. I enclose you two prints from negatives taken before and after doctoring; the difference will be apparent without marking.—Yours respectfully,

M. DUBOY.

"Carlisle, February 26, 1868."

We may remark, at the outset, that the prints enclosed show very satisfactorily the improvement which had been effected by the treatment employed. But it seems evident from the description that an unnecessary excess of the permanganate had been employed, too little time being allowed for the reactions to be completed before adding more of the permanganate. A 20-grain solution has generally been recommended; but we should recommend for general use among photographers a still more dilute solution: one containing 10 grains to the ounce will probably answer every purpose. The bath to be treated should be turned out into a beaker or bottle, and a small portion—say a drachm—of a 10-grain solution to a pint of nitrate bath added, the solution being then agitated. If the pink colour rapidly disappear, a little more may be cautiously added; and when a faint tinge of the pink or purple colour remains, the solution should be set aside for a few hours to allow the reaction time for completion. It is not necessary to go on adding permanganate until all trace of the smell of alcohol is removed, as a portion of that body may be present without producing injurious results. The "chocolate-coloured deposit" would be binocide of manganese, and, probably, a little permanganate of silver, as the bath is described as being reduced in strength. It should be remembered, however, that the strength of a solution as ascertained by its specific gravity is not very accurately indicated after treatment of this kind.

We hope shortly to lay before our readers the result of some experiments with permanganic acid, by which we believe all the advantages of the potash salt may be secured, and, at the same time, immunity from some of the possibilities which we have indicated.

In a former article we suggested that permanganate of potash might be found useful for oxidizing the final traces of hyposulphite in silver prints. Experiment shows, however, that its action cannot be rendered available, the prints becoming discoloured by its action. The albumen decomposes the permanganate, and itself becomes stained with the brown tint of the binocide of manganese formed.

THE CARBON PROCESS, NOT BRAUN'S.

We had occasion, some little time ago, to correct a statement by the Abbe Moigno, in which he spoke of the carbon process so successfully worked by M. Braun, of Dornach, as the discovery of that gentleman. As error has frequently a singular vitality, we again feel it our duty to correct a similar error, repeated with much circumstance, by our English contemporary the *Athenæum*, as such a statement by a journal of considerable influence is likely, if uncontradicted, to carry weight, and might possibly be hereafter quoted as evidence. In a recent notice of the admirable reproductions of M. Braun, now exhibiting at Leggatt's Gallery, in Conduit Street, and at Colnaghi's, in Pall Mall, our contemporary says:—

Some few years since it was announced that M. Adolphe Braun, of Dornach, a French subject, had devised a method of reproducing the admirable results of photography with perfect success, and, what was of hardly less importance, unchallengeable permanence. Also, it was stated that the artistic world was to have the benefit of this method by its being employed to copy, in complete fidelity, drawings by the old masters, and of their pictures, such as broad or monochromatic treatment offered fairly to the chemicals of the camera. This desirable method is styled the carbon process. Photography had long before done all, or nearly all, that was to be desired in transcribing faithfully, but beyond that nobody trusted the salts of silver, which, protean as they are before the light, and affected by time, too often left of a costly and exquisite reproduction nothing better than a sere and spotty waste of paper. Folks wondered why these unfading transcripts of photographic copies—improved upon ordinary photography as they are—were not brought to England in larger numbers than private hands could bear. Here, at last, they are to be deeply enjoyable, and purchasable cheaply with wealth and amplitude of choice from half the famous cabinets of Europe. Messrs. Colnaghi, of Pall Mall East, and Messrs. Hayward and Leggatt, of Cornhill, have hung the walls of large rooms with copies so exact, that it would be next to impossible to decide between them and the originals; and in such numbers, that almost all the great masters are displayed, as it were, by their first thoughts and swiftest workings at home, before the models supplied the bare and crude materials for art in the grandest pictures. What may be bought for a few shillings must be shown by noting the prominent items out of a gathering which is so very great and rich in beauty and associations that it would supply the means of amplest satisfaction to the best-stored minds—a whole education to the tyro and the amateur.

A facsimile—imperishable, as the men of science say, and perfect, as we know—of Michael Angelo's original study for maternal "Night," on the Medicean tomb at Florence, may be had for 7s. 6d. It is a drawing preserved in the Louvre, in Italian chalk, on paper that is now grey.

We have not space to follow our contemporary through an admirable criticism of this and the other works produced in carbon, which concludes by a statement that the drawings in the British Museum are in course of reproduction by the same process. Our duty here is simply to repeat what we have before stated, that the process used by M. Braun is solely and in every detail that of our countryman, Mr. J. W. Swan, of Newcastle-on-Tyne, whose French patent was purchased by M. Braun, who now most successfully carries out the instructions and arrangements which Mr. Swan visited Dornach to introduce. We are glad to be able to state that there is every probability that the valuable drawings of the British Museum will be reproduced by this perfect and permanent mode of securing facsimiles. We shall shortly be able to announce more precise details of this project.

VISITS TO NOTEWORTHY STUDIOS.

MR. SARONY'S STUDIO AT SCARBOROUGH.

We shall next ask our readers to accompany us to one of the largest and handsomest establishments devoted to photographic portraiture in this country: we probably risk no error if we say in the world. Metropolitan photographic establishments in which considerable business is done are often very much limited in extent and convenience by the exigencies of position; whilst ordinary provincial establishments are generally bounded by the limited requirements of the business; but a first-class fashionable watering-place, with opportunities equal to those of London for the creation of a lucrative extensive business, generally offers at the same time unlimited facilities for building and organizing an establishment as complete and comprehensive as the largest business requirements or the boldest enterprise may demand; and hence it happens that, in such places, some of the noblest buildings devoted to photography are to be found.

Mr. Sarony's establishment is probably the most extensive of the class. It is a magnificent building in the middle of a square of handsome residences. If it had been of Gothic instead of Italian elevation, it might easily have been mistaken for a church. As it is, the first impression is that it is a Town Hall or some other public institution. The building itself is 153 feet by 66 feet, and is surrounded by a garden consisting of ornamental lawn and shrubs, the extent of which is 240 feet by 180 feet. Ascending a broad flight of steps, and entering a spacious vestibule, a series of reception-rooms on either hand are seen, each devoted to a certain class of specimens, for every style of picture produced in the establishment has its own apartment, where it may be displayed to advantage without being killed by the presence of another style of work. Artists know well that oil paintings and water-colour drawings hanging in juxtaposition mutually injure each other; the water colours appear to lack force by contrast with the oil paintings, and the latter seem to lose delicacy and purity in the presence of water colours. Here, then, each class—plain photographs, photo-crayons, porcelain pictures, water-coloured photographs, and oil paintings—has its appropriate gallery, where its qualities may be fairly examined under fair conditions.

Ascending the broad flight of stairs leading from the vestibule, we enter the largest of these reception-rooms, described as the drawing-room—for we may remark that every room in the house has its name and purpose inscribed in gilt letters above the door. The drawing-room is a magnificently decorated and handsomely furnished apartment, 50 feet long by 33 feet wide. The decorations of the room are in exceedingly fine taste, and, although extremely gorgeous, the *tout ensemble* is quiet and harmonious. Without entering into details of description, it may enable the reader to form some conception of the character of the room if we state that we understand that about two thousand pounds were expended upon its complete equipment. On easels, on tables, &c., fine examples of water-coloured portraits are scattered about this room, which is, we understand, during the season, generally crowded with fashionable visitors.

Our readers would risk some bewilderment if we were to ask them to accompany us through the 59 rooms into which the building is divided; 33 of which will be devoted to business during the coming season, 21 rooms, the number hitherto used, having been found insufficient. Ascending from the drawing-room and passing various dressing-rooms, painting rooms, enlarging rooms, and rooms devoted to different branches of the business, we reach the studio or glass room, which we are agreeably surprised to find is not uselessly large: it is just large enough for perfect efficiency, but not so large, as in some cases we have seen, as to sacrifice efficiency to appearance.

The studio permits the most rapid working of almost any that we have ever seen: the exposures in our presence in the month of January averaging from five to seven seconds

with a Dallmeyer's No. 2 B lens and the second or third stop. In summer the exposures must be nearly instantaneous. The total length of the studio is 27 feet; its working width does not exceed 10 or 12 feet, although more space could be included if required. Of the length, 10 feet at the end, where the camera stands, are quite unlighted, something in the nature of a tunnel. The side-light, which faces north, is 14 feet long and 9 feet high; the top-light—the form of the room being that of the penthouse or lean-to—is 14 feet long by 8 feet broad, both top and side-light being clear glass. A small portion of high front light can be used, which is placed at the point where the tunnel commences; it is usually, however, covered with blinds. About 3 feet at the end where the sitter is placed are opaque side and top; a white calico blind at the top, over the head of the sitter, is the chief blind used; a white blind for reflecting light on the shadowed side is at times used, where the character of the head or the effect desired renders it necessary. In summer, direct sunlight is prevented from entering any part of the studio by narrow blinds placed on frames outside. Mr. Sarony contemplates stippling the whole or part of the skylight in imitation of ground glass, so as to subdue the top-light a little, making the side-light the dominant light. With the present arrangement, however, the results produced are very fine, bold, delicate, and well-modelled.

Mr. Sarony always, in producing card negatives, works on a plate 12 by 9½ inches. Upon this plate eight distinct portraits are taken, consisting at times of as many different positions of one person, or of the portraits of several persons. Usually each plate contains the portraits of at least two persons, and sometimes of four. The camera is provided with one lens, and a repeating back giving eight single exposures. At first glance this mode of working seems to involve several difficulties: there is the danger of the plate drying and producing stains, from the length of time which must elapse when eight distinct exposures, with varied arrangements, are given between the excitement and development of the plate; and there is the still more serious difficulty of uniform printing from images of possibly unequal density; and the further difficulty of some portraits on the plate having occasionally to be rejected. Notwithstanding this, Mr. Sarony regards the mode of working as economical and convenient. To make it so, it is evident, however, that two important qualifications in the photographer are imperatively necessary: we mean rapidity and certainty in operating. These Mr. Sarony possesses in an essential degree. In the negatives we saw, a singular uniformity of excellence and of printing qualities prevailed, and whether they contained one, two, or four persons, as a rule all seemed good, although it is quite certain that at times some of the portraits on a plate must be rejected. In rapidity of posing and arrangement, and in securing variety, grace, freshness, and spirit, in his poses, we have rarely seen Mr. Sarony's rival. In one case, of which we especially noted the time, a lady received eight different exposures on one plate, some sitting, some standing, and all graceful; the operation was completed in ten minutes.

It must not be forgotten, however, that for much of this rapidity in securing varied poses, important facilities are given by Mr. Sarony's patent posing apparatus, or head and body rest, which we noticed some time ago; which, by the readiness with which it is adapted to almost any position, materially aids the clever artist in rapidly and efficiently carrying out his arrangements; and that the security and support it gives the sitter materially lessens the waste of time and spoiling of plates which would otherwise occur from moving.

The most important part of the work in the establishment consists in the production of enlargements for colouring in different modes; and the facilities for effecting this work are exceedingly complete for working either with sunlight or the oxyhydrogen light, a Monekhoven's apparatus being used for the former. In some cases, in working on canvas, a

developing process is used, but recently Mr. Sarony has chiefly used the carbon process in securing a basis for important paintings. Mr. Sarony has, we understand, secured the sole patent of Mr. Swan's process for Scarborough, and intends next season to prosecute it with vigour. A steam-engine of two-horse power was in course of erection during our visit; it is intended for aiding in making and drying the carbon tissue.

A spirit of active enterprise, in which no effort of any kind which may conduce to the excellence of results or to the convenience of sitters is spared, seems to govern the establishment. Fixed at one end of the studio, and ready for use in a moment, is a copying camera in which transparencies can be produced from a negative as soon as it is taken; the transparencies placed in the huge magic lantern or enlarging apparatus with the oxyhydrogen light, and projected on the screen amplified in such degree as may be required to enable the sitter to form a very perfect idea of the finished effect of the enlarged picture from any one of the negatives taken, and permit a ready and certain selection from the choice presented. This is one mode in which the convenience and satisfaction of the sitter are consulted and expansion of business promoted. Another, recently introduced, is the production of a cabinet negative of each sitter requiring a card. The camera, with a plate taking four cabinets, and repeating back, is placed just behind and to one side of the card camera, the exposures being simultaneous. At the completion of the actual order the cabinet prints are shown, and, of course, many sitters are pleased to obtain excellent portraits in such a satisfactory size and style without additional trouble.

The coloured work possesses a degree of excellence rarely attained in painted photographic portraits, artists of the highest skill being employed in each department of the work. During the season a large number of artists are employed, some of them being retained throughout the year, the best work requiring skill, and time being inevitably in arrear at the end of each season. An excellent illustration is here afforded of the influence of photography on the profession of the miniature painter, which at one time it was alleged to have ruined. Several of the best artists in this establishment earn each from five to six hundred pounds per annum. On one occasion Mr. Sarony made an arrangement with a miniature painter of reputation to colour his work, guaranteeing him a thousand pounds per annum; the amount the artist actually received for work done in a year was considerably more than that sum. In the colouring of the portraits in Mr. Sarony's establishment the principle of division of labour is usefully carried out, some artists being engaged on flesh and some on draperies. For instance, in the portraits finished in water colours, the draperies and backgrounds are all painted by an artist of high reputation, whose portraits are familiarly known in the once popular and fashionable Books of Beauty which were annually published; they then pass into the hands of a gentleman with rare skill in painting heads, to be finished.

We have referred to the use of carbon printing as a basis for the oil painting; but if the finishing of any photographic portrait render it independent for permanency upon the process by which it is produced, it should be so here. The enlarged image having been duly produced by the photographer, the canvas passes into the hands of an artist, who works on it in black and white, producing an admirably finished portrait in monochrome; and as this is all solid colour the portrait must remain, even if the photographic image fades. After this treatment it passes into the hands of the artist, who finishes it in colour. The portraits of this class of work, which we saw, by the chief artist in this department, were admirable examples of oil painting, equalling the majority of the portraits which we find in each year's Royal Academy Exhibition, and surpassing some. There was a gratifying absence of the hard, crude, raw, opaque effect too common in oil-coloured photographs. The flesh painting was solid and firm, healthy and pleasant in colour, a luminous

and transparent effect pervading the whole picture. The prices for this class of portraits, we are glad to add, are commensurate with the work, ranging from twenty to a hundred guineas.

We should simply confuse our readers, without edifying them, if we were to ask them to accompany us through every room, devoted, from garret to basement, to portraiture, in this large establishment. It is throughout a noble monument of photographic enterprise, the creation of individual skill and energy. Few men have more daring and energy than Mr. Sarony, few more readiness or versatility in resource, few more aptitude in seizing occasion and manipulating circumstance to business ends, and these are all elements in securing a great success; but underlying all this, and forming a solid basis for the connection gained by business tact, is a thoroughly fine artistic taste, and a rare degree of photographic skill, the result of natural aptness, and the practical experience of more than a quarter of a century spent exclusively in photographic portraiture. Mr. Sarony commenced the photographic profession as a Daguerreotypist in Canada, in 1842, and has practised it in this country, in its various phases, since 1844. His career has been a singular and adventurous one, full of interesting and instructive episodes, which we may one day detail. Not the least gratifying of these incidents is recalled to our memory by the sight of two silver medals, one from the Board of Trade, and one from the Royal Humane Society, for "saving life." The incident is probably fresh in the minds of our readers, when, a few years ago, during a memorable and terrible storm, Mr. Sarony plunged into the boiling surf to save the lives of men from a vessel broken to pieces on the Scarborough rocks, and how he brought to shore the body of his companion in the heroic work, Lord Alfred Beauchere, whose life was beaten out of him by the turbulent waters.

We have visited Mr. Sarony's studio in winter, and obtained a brief glance at its capacity and arrangements; we shall probably revisit it again in the season, and ask our readers to accompany us further through its varied and suggestive departments.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

PHOTOGRAPHIC PIRACY—MR. McLACHLAN'S DISCOVERY—EXHIBITION OF PHOTOGRAPHS—BRAINS IN PHOTOGRAPHY—THE DISCOVERY OF THE CARBON PROCESS—"PUNCH" AND "FUN" ON PHOTOGRAPHY—THE PHOTOGRAPHIC SOCIETY OF LONDON—THE SOCIETIES.

I HAVE often been puzzled by observing that certain forms of crime or misdemeanour are regarded by society, or some portions of it, with a very lenient eye; and it is generally, moreover, to a class of crimes which, in a high code of morality, would be regarded as without palliation, that this gentle consideration is given. A tradesman is, for instance, in the constant habit of giving short weight, and defrauding the poor of five or ten per cent. of the small pittance which is to keep body and soul together. After having continued this practice for years, and acquired by it many hundreds of pounds, he is perhaps convicted, and, after paying a trivial fine, again proceeds on the even tenor of his way, not scouted from society, not branded, not ruined. So if, instead of giving short weight, he adulterates his goods, he may generally escape scot free; whilst the starving wretch who steals a loaf of bread must, if convicted, inevitably bear the taunt for life of having been a gaol-bird.

The reflection is very trite; but I am reminded of it by the recent convictions for piracy at the Guildhall. Piracy has too long been regarded by many with a leniency similar to that extended to adulterations and similar peccadilloes. It has been regarded as something illegal, but scarcely immoral; and if it were managed so as to just escape the law, it was rather clever than blameable. If Mr. Graves, for instance, after spending twenty thousand pounds upon

bringing out an engraving, had the misfortune, through neglect of his own or of any of his people, to issue a single impression not bearing the publication line, the Philistines might be upon him, his plates might be pirated, his outlay wasted, and himself ruined, without obtaining protection from the law, or much sympathy from the public. In most cases where photographs have been so pirated, all kinds of singular impediments have, by authority, been thrown in the way of obtaining redress, and convictions have been difficult to secure.

When, therefore, in two recent cases, Sir R. W. Carden has inflicted fines amounting in the aggregate to £380, it strikes many people with a refreshing sense of justice. The cases, as reported, appeared to be without any defence beyond legal technicalities. I remember some time ago in these columns pointing out that the question of piracy had two sides, and that where proprietors of pictures had, for purposes of their own, voluntarily resigned the protection of the law by neglecting to comply with the conditions upon which the law gave them a secure property in their ideas, they ought not to complain that these ideas become the common property of the public. In these cases, however, the convictions were obtained for the piracy of clearly defined property, for which every pains had been taken to secure the protection of the law; and few people will, we apprehend, be sorry that a severe penalty has been enforced. I hope that, for the credit of the art, the recent cases will serve as a terror to evil-doers for some time to come.

I glean from your recent remarks on Mr. McLachlan's discovery that my formerly expressed idea that there is really something in it is correct: how much it seems we must wait to learn. But the fact that two gentlemen like Mr. Spiller and Mr. Le Neve Foster, after having listened to the statement, required to verify it by experiment, suggests that they were neither in a position to exclaim "Bureka!" nor "Moonshine!" That, at least, is the deduction I draw from the slender premises yet accessible.

There have been two or three exhibitions of photographs open in London lately, which those of your readers who have opportunity would do well to visit. A fine collection of carbon prints by Braun, chiefly of reproductions, is exhibited at Leggatt's Gallery in Cornhill, and a similar collection at Colnaghi's. There is also an exhibition of Mrs. Cameron's pictures at the German Gallery in Bond Street, the photographs at which have won many favourable opinions from the art critics. There is something rather amusing in the mode in which this praise is bestowed: in some cases with something like an apology, on the ground that they are so little like photographs. The *Athenæum* is rather perplexing, for whilst "warmly commending" them to the "general student and artist," it remarks, in reference to those of them who "aim at that which is properly brain-work, the less said about them the better for all parties." Now, since the sole merit possessed by Mrs. Cameron's photographs belongs solely to the brain-work put into them, and is due not to mechanical, chemical, or manipulatory excellence, nor to technical superiority of any kind, but is solely the result of the artistic feeling and artistic treatment which give them a value in spite of technical shortcomings, it is odd enough, surely, to condemn the brain-work and praise the results. This is, however, mere inconsistency; but the same journal, referring to the exhibitions of carbon prints, announces the process, with much circumstance, to be the discovery of M. Braun. After the publicity which has been so repeatedly given to the fact that the discovery of carbon printing as a practical process is due to an Englishman, and that it only belongs to M. Braun by purchase from Mr. Swan, it is surely something more than inconsistent merely, or careless, in a journal like the *Athenæum*, to gravely make such an announcement.

It seems that *Punch* thinks the old idea of taxing photographs worth reviving. A penny stamp is such a small tax on each picture that no one would object to pay it, *Punch* thinks. But unfortunately, it would not, I fear,

come out of the pockets of the purchasers. The normal price at present of a card portrait is one shilling, and it would be very difficult to induce the public to pay 1s. 1d. The photographer would have to bear the brunt, and it would simply amount to an average impost of 8 per cent. upon the total amount of business done by photographers generally. If the principle were carried out and applied to all trades, it would certainly render an income tax unnecessary; and if applied to photography, there could be no reason why other industries should not be similarly taxed.

I see that *Fun* also has been interesting himself in photography, and has evidently been reading your pages, for he contrived to have a laugh at one of your correspondents. What a pity that he should first misquote, and then laugh at the blunders he himself has made. Scarcely worthy of *Fun*, this! It is possible to wear the cap and bells, and yet be accurate in such a little matter as a quotation.

I am glad to see that the Photographic Society of London commences this year with a prospect of greater success and prosperity than it has possessed for some time. It has been not a little amusing to hear the charges of mismanagement, especially of a financial kind, which have from time to time been brought against it during the last few years, chiefly by those who never contributed a shilling to its funds, and who therefore could have no legitimate concern in their expenditure. It has, however, been generally understood for some time past that the finances of the Society were at low water; and seeing that the whispered statement has generally been accompanied by an intimation that it had at one time possessed funded property, which, like a spendthrift, it had got through in some unknown manner, your recent explanation of the way the money has gone has, to my knowledge, done good service, and satisfied many worthy persons. Only one or two of the large items referred to seem to have been for objects which could not advance the art, and one of these is of a nature which should silence cavilling on the score of expenses in one quarter, at least.

The annual meeting promised well for the interest of the coming year. Mr. Johnson's suggestion for rectifying old baths has been employed successfully in more than one instance coming within my knowledge. Why was permanganate of silver, as proposed by Mr. Crookes, not more generally tried? I presume, because the salt was not found generally in commerce. Mr. Solomon's production of a fine enlargement in half a minute by the magnesium light seemed to take everybody by surprise, but left no doubt about the success. The interesting photographic experiences of Dr. Mann in tropical climates, the new phase of landscape photography by Mr. Johnson, and the photo-lithographic and photo-engraving experience of Mr. Griggs, which are promised in meetings yet to come, must give great interest to the proceedings; and such anticipations must help to maintain and increase the vitality of the Society.

The paper read at the North London Society, on glass for photographic purposes, should, and doubtless will, attract an amount of attention to a neglected subject which it is surprising it has not hitherto received. The possibilities of change of colour in glass are unfortunately beyond the control of the photographer; but an occasional examination of a broken pane is easily made, and it would well repay a portraitist to have his glass room re-glazed now and then, if he could, by doing so, shorten his exposures by one-half. In any case, it should call attention to the importance of occasional thorough cleansing. At the South, Mr. Taylor's suggestion for the use of safety-valves in gas bags, and Mr. Fry's *Omniun Gatherum*, were capital papers. At the Edinburgh Society, Mr. Davies read a paper on a desirable improvement in mounting view lenses. Some of M. Salomon's portraits were exhibited, and elicited some judicious remarks on their beauty from the Secretary; and a commendable protest from Mr. Davies against the Vandalism of a proposal to destroy one of the pictures in order to ascertain if it were

touched, as he was not aware that any disavowal of the aid of the pencil had ever been made by M. Salomon; nor, he might have added, I think, by any one else for him. One gentleman held a different opinion as to their beauty, and thought that many of them were such as hardly any true artist could have perpetrated. I hope that after such a verdict, M. Salomon will feel sufficiently ashamed of his work. At the Manchester Society, Mr. Nolon read a paper on apparatus and Materials for the production of oxygen. The annual soirée of this society was a success. An eloquent and exhaustive address by Mr. Green, President of the Bradford Society, at a recent meeting, well repays perusal. Several of the provincial societies seem to have fallen into abeyance, but those still in a state of activity seem, from the papers and discussions, to be in a healthy condition.

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS. BY H. P. ROBINSON.

CHAPTER VI.

"In the fine arts that composition is most excellent in which the different parts most fully unite in the production of one unmingled emotion, and that taste the most perfect where the perception of this relation of objects, in point of expression, is most delicate and precise."—*Alison*.

"The unlearned eye first admires painting as an art of imitation; it is only from the progress of our sensibility and the practical cultivation of our minds that we begin to comprehend the greater compositions of genius, after which the unity of expression is felt to be the great secret of the power of painting."—*Sir Thomas D. Lauder*.

"The great object of composition being always to secure unity—that is, to make out of many things one whole—the first mode in which this can be effected is by determining that one feature shall be more important than all the rest, and that the others shall group with it in subordinate positions."—*Ruskin*.

UNITY.

In my first chapter I spoke of unity as one of the essential constituents of a successful picture. In some respects it would have been better to have considered what was meant by unity in that place, but it would have delayed me in placing before the student the law of balance and contrast in which I was anxious to secure his interest at the outset.

In speaking of unity as one of the essential elements of composition, I did so from a firm conviction that whatever beauties a picture may contain, however exact its imitation of nature, correct its arrangement of lines, beautiful its colour, extreme its finish, or great the dexterity of handling manifested, no perfect sense of satisfaction will be conveyed to the eye if the lights are scattered, if breadth of light and shade be not preserved, or if two or more episodes, unconnected with each other, appear on the same canvas.

Unity has been well defined as "the keystone of nature, and expresses the harmony of the Divine mind as rendered in creation." Unity can only be attained by a study of first principles. It is the law of nature that principle shall precede details; in the account of the creation of the world the general design is described as first laid down, and the details as following. Unity is so simple that it is often overlooked; but no success in any other qualities desirable in a picture, as I have already said, will compensate for its absence. In photographs, where there is no colour to distract the attention from the design, it is especially necessary. It is the absence of unity in the arrangement of the figures in a photographic landscape that so often mars the beauty of an otherwise effective picture. It is too often the practice to scatter figures, dressed inharmoniously with the scene, over the foreground of a landscape, without any reference to one another or the propriety of their being there at all, and so unity is disregarded and lost.

Like most of the elements which constitute a good picture, unity is a quality more easy to feel than describe; but I think I shall not be far wrong if I define it as the fit connection of all parts to a perfect whole. The province or function of unity is to combine and bring to a focus the secondary qualities, such as variety, contrast, symmetry, &c.

It is equally opposed to scattered ideas, scattered lines, or scattered lights in a picture. In nature, light, when broken in its passage, though the amount be diminished, is rendered more irritating to the eye. We can bear the full, uninterrupted splendour of the setting sun, but when its rays are cut up and divided by passing through a screen of leaves and branches, the irritation affects the least educated eye. This feeling of irritation, caused by spotty lights, more properly belongs to the subject of light and shade, and will be spoken of in its proper place further on; but there is a unity of lines and a unity of action that must be considered, more especially in the composition of figures; but unity of purpose is as necessary in the expression of a landscape as unity of action is in the figure-subject. All objects must assimilate in one point, however dissimilar they may be in others. There must be some conformity of tone and relation of line, however great the variety in the leading characteristics of the view.

In photographing any object, whether landscape, portrait, or group of figures, one leading idea must be maintained. The fact that has to be stated must not be clouded with confusion. The work should constitute one whole, it should fully pronounce its own meaning, there should be nothing left for verbal explanation. A picture should not require a showman; a picture that does not tell its own story is as tiresome as a volume overlaid at all parts with notes and annotations to explain that which should need no explanation. In a landscape will always be found some object of more importance than the rest, to which all other parts are subordinate, and to which all other objects lead; it will be the duty of the photographer to choose such a position for his camera as will increase this effect, so as to make the most of the principal object, or the subject of the picture, and to allow no rival to be near to detract from the full effect. A very common instance of the loss of unity in photographic landscapes is in the position and action in which figures are placed. I have an example in my portfolio, a description of which will illustrate how much mischief may be done by this disregard of unity.

The scene is a rural lane crossed by a brook, and closed in with trees. Halfway down the lane, growing on the flower-covered bank, is seen the trunk and gnarled roots of a grand old oak, which receives the principal light, which is repeated in the water, and gradually diffused through the picture. Stretching from the left are the dark and graceful branches of a sycamore tree, which, extending partly over the trunk of the oak, by the opposition of their dark leaves in shadow, increase the brilliancy of the chief mass of light, and assist in leading the eye to the principal object. There is no mass of light so large or so high in tone as that on and around the tree trunk—not a line out of place; and it is altogether one of those scenes on which the eye loves to linger, and which can be quite expressed by photography. And yet this is one of the most irritating pictures I ever saw. The cause of the irritation is supplied by comparatively a very small part of the whole; but it is there so palpably, that I keep the picture only as a warning, and never look upon it for pleasure. In the centre of the picture, cut out sharply against the light, looking straight into the camera, having no part in, and, apparently, caring nothing for the lovely scenery around, is this figure. And thus one of the most beautiful photographs I know is spoilt by this ridiculous incongruity, which destroys all unity. If two or three village children had been introduced, naturally engaged picking flowers from the bank, they would have appeared like a rich cluster of jewels in an appropriate setting.



The same remarks apply equally to portraits or groups, of which more in the proper place; as the subject will receive fuller treatment in the section devoted to light and shade.

In this chapter I direct attention to a principle rather than to mere rules, which can be expressed in so many words. But

I must impress thus early upon the student this dominant idea; that if a picture is to be successful, it must have a oneness of purpose, a oneness of story, a oneness of thought, a oneness of lines, a oneness of light and shade. Everything must have a meaning, and the meaning must be the object of the picture; there must be nothing "to let."

I am the more desirous the student should "feel" what unity is, because unity and balance together constitute the chief mechanical elements of pictorial effect, and may exist altogether apart from any story to be told or intention to be expressed in a picture, although the telling of a story rightly is a part of unity, which seems paradoxical. These two, balance and unity, should therefore be thoroughly understood first, and other elements of harmony, such as refer to intention, subordination, keeping, &c., are not the less important, but will always be all the more perfectly understood and expressed after the student has thoroughly grounded himself in the more mechanical elements; as, however prolific a man may be in ideas, he cannot express these ideas intelligibly until he has learned a language and its grammar, or laws of construction. Balance and unity are principles of construction, upon which must be based every intention to be expressed in the picture. I lay the greater stress upon this initial idea, because it has too often happened that the art-teaching which has been supplied to photographers has dealt rather with the thoughts to be expressed than on the modes of expressing them; and it is of little use endeavouring to teach a man to write poetry until he has learned to spell.

PRINTING BY DEVELOPMENT.*

During the winter months, when daylight is weak and dull, and there is little of it, the process of printing by development offers a useful and precious resource available for the production of prints. The process, which is likewise very suitable of application in producing enlargements by means of the solar camera, is similar in its manipulations to the ordinary collodion process, where the image is obtained by the aid of a reducing agent; and the materials employed in both cases are almost identical.

FIRST METHOD WITH CHLORIDES.

Salting Bath.

Chloride of sodium (common salt) ...	65 grammes
Hydrochloric acid	6 drops
Rain water	375 cub. cents.

The paper is immersed in this bath, and allowed to remain therein for two or three hours, after which it is taken out and dried.

Sensitizing Bath.

Nitrate of silver	30 cub. cents.
Citric acid	5 grammes
Rain or distilled water	250 cub. cents.

The paper is floated on the bath for three minutes, and is then drained and suspended on clips, care being taken to remove any accumulation of liquid at the edges or in the corners. As soon as the paper is nearly dry, it is exposed to light under a negative or upon the screen in the solar camera, until the appearance of a faint image is observed. With a negative exposed to direct sunlight, the duration of this operation should never exceed three or four seconds; in bad weather a minute, or even more, will be necessary. When the impression is sufficiently distinct, the paper is withdrawn from the frame, and placed, face uppermost, upon a glass plate somewhat smaller in size than the sensitized sheet; the top and bottom edges of the paper are then folded under the glass, and the whole placed at the bottom of a large gutta-percha developing dish.

* *Moniteur de la Photographie.*

Developer.

Pyrogallic acid	...	...	8 grammes
Citric acid	...	...	4 "
Water	...	...	190 cub. cents.

A quantity of the developer, sufficient to cover the paper, is then poured into the bath, which is then tilted a little on one side; by a steady movement the solution is then made to flow smoothly over the surface of the print in such a manner as to prevent the formation of ripples or back-flowing of the liquid. This is a very important point in the manipulation, for the slightest unevenness of flow in the developer will produce the same injurious effect upon the print as it would upon a collodion plate. The development is very soon accomplished, as rapidly as with the wet collodion process, and demands the same amount of care and vigilance. When the operation is judged to have gone sufficiently far, the developer is drawn off by means of a tube fitted to the bottom of the bath, and the print is then carefully washed by means of a rose. It is fixed with the following solution:—

Fixing Bath.

Hypo sulphite of soda	...	...	30 grammes
Water	...	...	500 cub. cents.

The prints are immersed in the fixing liquid, and allowed to remain there until the whites have attained the requisite purity; this requires an interval of from ten minutes to half an hour, and when properly fixed, the prints are finally well washed to remove all traces of hyposulphite.

SECOND METHOD WITH ALBUMEN.

Salting Bath.

White of egg	...	...	310 cub. cents.
Distilled water	...	...	470 "
Chloride of sodium	...	...	4 grammes
Bromide	...	...	4 "

The salts are dissolved in the distilled water, and the albumen then added to the solution; the white of egg should be beaten up to a froth, and allowed to stand in a cool place for several hours, when the clear liquid is carefully decanted or filtered off and added to the salting bath.

The paper is floated upon the bath in the ordinary manner for about three minutes, and then suspended by wooden clips to dry. When dry it is placed in a long metal box, and plunged into a deep saucepan, full of boiling water, care being taken that the water does not touch the paper, but that the whole surface of the latter is subjected to the temperature of the steam. This operation, which is instituted for the purpose of coagulating the albumen, will be more successful if the hot steam is allowed to come into contact with the albuminized surface; but at the same time this part of the process is not absolutely necessary, as the coagulation may always be effected in the sensitizing bath.

Sensitizing Bath.

Nitrate of silver	...	...	30 cub. cents.
Distilled water	...	...	375 "
Citric acid	...	...	12 grammes
Alcohol	...	...	30 cub. cents.

The paper is sensitized, and dried in the ordinary manner. An exposure of eight to ten seconds will suffice in the sunshine, but a period of several minutes is necessary in a weak or diffused light. It is only when the image has become perfectly visible that the exposure can be deemed to have been sufficiently long.

Developer.

Gallic acid	...	...	3 grammes
Distilled water	...	...	60 cub. cents.

The operation of developing is best conducted in a gutta-percha or glass bath. The print is first slightly moistened in order to make it adhere to the bottom of the bath, and the latter being tilted, the developer is poured in, and then made to flow evenly over the surface of the paper; care must be taken that the liquid covers the whole surface uniformly. If the exposure has been nicely regulated, the development of

the image is brought about very rapidly, at the end of two or three minutes; in cold weather the operation may be accelerated by employing a somewhat stronger developer, or by slightly warming the solution. The gallic acid, when dissolved, possesses a strong tendency to become mildewed, and a small piece of camphor or a drop of essence of clove should, therefore, be added to the solution to prevent the arrival of such an occurrence. An under-exposed print is very slowly developed, and the prolonged action of the acid imparts a dark, uniform colour to it, weakening all the half tones; on the other hand, an over-exposed print becomes rapidly developed, and must be promptly removed from the developing bath to prevent the whites becoming covered. The best prints are those in which the gradation is very regular, and the impression is somewhat weaker than in the finished photograph. The prints are washed and fixed in a bath containing—

Hypo sulphite of soda	...	...	30 cub. cents.
Water	...	...	625 "

The pictures remain in the fixing bath for a quarter of an hour, and are again washed. If the aspect of the prints does not prove satisfactory after this operation, a gold toning bath may be resorted to, to improve their appearance; any of the well-known formulae may be adopted. If the whites do not appear perfectly clear after development, they may be improved by immersing the prints after they have been well washed in a bath containing 30 grammes of chloride of lime and 300 cub. cents. of water.

THIRD METHOD WITH AN IODIDE.

Salting Bath.

No. 1.—Nitrate of silver	...	...	3·8 grammes
Distilled water	...	...	60 cub. cents.
No. 2.—Iodide of potassium	...	...	27 grammes
Distilled water	...	...	62 cub. cents.

The salts are dissolved separately, and the two solutions afterwards mixed, producing a yellow precipitate of iodide of silver. Sufficient concentrated solution of iodide of potassium is now added to dissolve the whole of the precipitate, and the bath is then in working order. The paper is floated on the liquid in the usual manner for about three minutes, drained, and hung up to dry; it is afterwards floated upon a bath of distilled water, the sheets being placed in pairs back to back, and allowed to remain in the water for several hours, care being taken to turn them over now and then. By this treatment the surface of the paper assumes an uniform pale yellow colour; the sheets are subsequently withdrawn from the bath and dried.

Sensitizing Bath.

Distilled water	...	...	800 cub. cents.
Solution of aceto-nitrate of silver	...	...	15 "

This last-named liquid is composed of—

Nitrate of silver	...	...	30 grammes.
Acetic acid	...	...	60 cub. cents.
Distilled water	...	...	300 cub. cents.

If the operator has no wish to provide himself with a supply of aceto-nitrate of silver, he may make use of the following formulae, which is less complicated:—

Distilled water	...	...	800 cub. cents.
Nitrate of silver	...	...	12 grammes.
Acetic acid	...	...	5 cub. cents.

(To be continued.)

ON CERTAIN PHENOMENA OBSERVED IN THE PHOTOGRAPHIC IMAGE.

BY M. L'ABBE LABORDE.*

THE last number of the *Bulletin* contains an article by M. Sidebotham, in which that gentleman enumerates the presence in photography of certain curious effects, the causes

* Read before the French Photographic Society.

of which he is able but imperfectly to explain. My object is to discuss the most common among them, in order to show that in photographs of scientific subjects one should not be too hasty to attribute to the action of light that which may possibly be produced by some other cause.

When two objects, the one white and the other black, are represented in a photograph, touching one another, the contrast is often exaggerated at the points where they meet, the white appearing more white, and the black more black. Many causes may tend to the production of this acknowledged fact; but before looking about for vague and uncertain reasons, let us first see what may be produced by a well-known cause connected with the circumstances under which the developer is used. When the developing agent is poured upon the exposed plate, it encounters a film of nitrate of silver spread equally over the whole surface; as soon as the blacks have appeared, the decomposed nitrate of silver in those parts has yielded up its metal, while on the other portions of the negative, where the light has made but a faint impression, it still remains almost intact. From the parts of the negative upon which it has acted feebly, the nitrate of silver diffuses itself over the adjacent blacks, and re-inforces the margins of those portions; and as it cannot give without losing, the whites bordering upon the blacks thus become more transparent. If the negative is agitated, this action, which is always more energetic wherever the whites and blacks touch one another, is pushed further; it is for this reason that a negative which is moved quickly to and fro during development comes out more rapidly during the first few moments, because the nitrate of silver not decomposed on the whites is made to pass and re-pass over the blacks. All these effects are repeated when nitrate of silver is added to the developer for the purpose of intensifying the negative photographs.

Photographs of the ordinary description do not suffer from these effects, but may even be benefitted by them; but in photographing scientific subjects—as, for instance, in the reproduction of celestial bodies—it is necessary to take these imperfections into account, for we must not attribute to the light that which is due to subsequent causes. The best means of preventing any error in this direction is to develop the image promptly, to wash it immediately afterwards, and, if it requires intensifying, to use an agent which is not quickly redaceable, thus preventing the diffusion of action from the whites to the blacks.

The following solution appears to me well adapted to the purpose, inasmuch as it may be employed in full daylight after the picture has been fixed; its action is very slow, and the density of the negative may be controlled, therefore, with the greatest nicety. It is as follows:—

Perchloride of iron ...	...	...	1 part
Bichromate of potash ...	...	...	3 parts
Water ...	...	...	150 „

The negative should be well washed before the employment of the solution, in order that every trace of the hyposulphite of soda may be eliminated, for if the negative is treated with the solution prior to its being fixed with hyposulphite, the image becomes weakened, and may disappear altogether.

Two films of nitrate of silver may be said to exist upon the latent image: firstly, that which runs freely over the surface after the sensitizing of the plate, and to which the developing agent is added; and, secondly, that with which the iodide is impregnated, and which it is very difficult to remove entirely—a fact demonstrated in certain dry-plate processes, where several washings are insufficient to remove the salt, and it is necessary to employ an agent to remove the last traces of the nitrate. It is this last-named film of nitrate which, conjointly with the developer, produces the picture in the way it has been painted by the light; the free nitrate upon the surface intensifies the image in the manner I have already mentioned. An image washed after development, and exposed to the action of light, assumes the appearance

of a positive, doubtless for the reasons given above, for the nitrate of silver not decomposed, which still impregnates the whites of the picture, has the effect of blackening the same; while the blacks, where the nitrate has already become decomposed, do not undergo any change whatever.

A negative intensified to excess sometimes yields a print in which the whites appear to encroach upon the neighbouring portions, the fine and strongly-lighted lines appearing larger than in nature. Can this effect be attributed to radiation similar to that produced by a bright light upon the organ of vision, or is it due to a lateral diffusion of light? It is possible that the solution of this problem may likewise be found in the subsequent action of the nitrate of silver in conjunction with the developer. In fact, if negatives of this description are carefully examined, it will be found that the blacks appear in relief; but this relief has not been produced only in a vertical direction, and the silver ought to have been deposited laterally, something after the manner in which it is found upon a strip of copper which has been plunged into a solution of silver; whence, therefore, come these blacks upon the negative, which trespass beyond their true limits.

I have observed, in very rare instances, a fact with regard to collodion, which occurred more often at the period when negatives were taken on paper; the whites of the print were bordered by a brown line, which likewise surrounded the blacks. This effect was produced, above all, when I added nitrate of lead or acetate of lime to the gallic acid for the purpose of hastening development, and when the picture thus treated remained untouched for some time. I was of opinion at the time that the deposit formed upon the blacks became slightly diffused, and impregnated the whites; but the regularity of the dark margin, and the circumstance that prolonged washing was incapable of removing the same, seemed to invalidate this explanation. The fact, however, I mention, in order to show once more that we should not be too hasty in attributing to light effects which, in reality, may be produced after the exposure of a negative to its action.

MORE PHOTOGRAPHIC PIRACY OF ENGRAVINGS.

ANOTHER serious case of photographic piracy was brought before Sir R. W. Carden, on Friday, at Guildhall, in which a conviction in fifty cases was obtained, and fines to the extent of £250 inflicted. The case is thus reported in the daily press:—

Henry Ashford, 3, Queen Street, Cheapside, printseller and photographic dealer, was summoned before Sir R. W. Carden by Mr. Henry Graves, of Pall Mall, publisher and engraver to the Queen, to answer fifty charges of unlawfully selling, on the 6th of February last, thirteen photographs of a painting called "My First Sermon," of the copyright of which Mr. Graves was the proprietor; also of unlawfully selling the following photographs, of which the defendant was not the proprietor, thirteen copies of "My Second Sermon," twelve of "The Railway Station," six of "The Morning before the Battle," and six of "The Evening after the Battle." Mr. George Lewis appeared for Mr. Graves, and Mr. Treherne for the defendant.

John Cattermole said he was in the employ of Mr. H. Graves. From instructions he received he entered into communication with Mr. Ashford. On the 3rd of February he received a letter from him directed to Mr. Clayton, a name he assumed. He had received thirty letters signed Henry Ashford in answer to letters asking for goods, which had been delivered in consequence of those letters. Mr. Ashford acknowledged the receipt of the money.

The correspondence extended over several months. Letters were then put in from witness, signed "John Clayton," ordering goods, and paying money in half notes and Post Office orders, the defendant's answer acknowledging receipt of money on the same date, also a letter dated February 7, 1868, containing the other halves of the notes, and further orders; and the answer to that, stating that the previous orders had been executed.

The witness said he sent a person named King to Southampton, and he brought a parcel. He subsequently sent him to Brighton, and he brought another parcel thence, containing twelve "Railway Station," thirteen of "My First Sermon," and thirteen of "My Second Sermon." He sent £7 4s. to the defendant, the price of six

"Morning before the Battle," and six "Evening after the Battle," but they had not yet been delivered. In assuming the name of J. Clayton he did so for the purpose of detecting the defendant. He had paid between £40 and £50 to the defendant for photographs he had forwarded in order to detect him.

William King (in Mr. Graves's employ) gave confirmatory evidence.

Mr. Henry Graves was then called, and proved the registration of the painting of the "Railway Station." He had never authorised any one to make photographs of his engravings except the one of each made by Mr. Spencer for the purpose of registration. The one plate of the "Railway Station" had cost him upwards of £25,000. The photographs were taken from his engraving. The charge for the engraving was £10 10s., and the photographs could be produced for 9d. by the maker. Mr. Graves proved the registration of the other engravings. He purchased the "First" and "Second Sermon" for £1,700. In consequence of the piracy he had not got back the money the paintings and engravings had cost him. He had never made and sold photographs of his engravings. The photographs were newly made. The publisher's line was on the photographs, showing that it was made since the plate was published. The photographs had even pirated the "trade mark."

Mr. Treherne called Thomas Ashford, brother of the defendant, who said he had been in partnership with him up to last year. He now carried on business at Newgate Street. He knew nothing of Cattermole or Clayton, and never heard of them while he was in partnership with his brother. A letter produced February 3rd was not in the defendant's handwriting. He did not know whose handwriting it was in. The five letters produced, which had passed between the defendant and Mr. Cattermole, were in the defendant's handwriting.

Mr. Treherne said Mr. Graves had entrapped the defendant into an illegal act, and urged that he ought to have photographed the pictures, and put a stop to the practice of which he complained. He then urged that the convictions could not be made on each summons, but on the whole as one sale. There was only one offence.

Sir R. W. Carden said it was quite clear that Mr. Graves did not instigate the defendant to sell these photographs, he being a dealer in photographs. It is only through the machinery Mr. Graves employed that it was possible to establish a case. He was very sorry that in one week, in the City of London, he had been called upon to adjudge upon two cases of monstrous fraud. Here was a little book issued by the Photographic Protection Society, and the only parties he saw named in it were H. Ashford, the present defendant, and S. B. Beal, who was the defendant a few days ago. It appeared to him that Mr. Ashford and Mr. Beal had established this society for the purpose of promoting the interest of photographic traders, and defending it from attacks upon the alleged ground of piracy.

Mr. Treherne said that the date of that publication was February, 1865. The society was in existence then, but it was not now.

Sir R. W. Carden said that Mr. Ashford and Mr. Beal were put forward as the managers of the institution, which he had no doubt whatever was established for the protection of themselves, and themselves only. They stated that they had large funds, and he hoped there was enough to pay any penalties that might be imposed.

Mr. Treherne said unfortunately there were not.

Sir R. W. Carden was glad to hear that people had not been trapped, as he might call it, into subscribing to this society. He was sorry that two tradesmen in the City of London could act so dishonestly. As to there being but one offence, if a man could sell five hundred or five thousand photographs in one lump, and only pay a penalty of £10, there would be no protection at all, and therefore the penalty would be not only for every offence, but for every copy issued, and he was sure that this was what the Legislature intended. There had been fifty cases proved before him, and he should inflict a penalty of £5 for each case, or, in default, one week's imprisonment; that was to say, £250, or fifty weeks' imprisonment.

Mr. Treherne applied for a case to be stated for a superior Court.

Sir R. W. Carden said the application must be made in writing, and, in the meantime, the defendant could pay the fines under protest. The fines were accordingly paid under protest.

Mr. BEVERLEY announced that he should shortly read a paper on the "Dry Plate Process."

A vote of thanks was passed to Messrs. J. and J. Holderness, of Preston, for five cartes for the album, which were much admired.

There being no other business, the meeting then terminated

Correspondence.

"PHOTOGRAPHY AND DISEASE."

MY DEAR SIR,—I was much interested by your article in the NEWS of last week on "Photography and Disease," having been a severe sufferer myself; and shall have much pleasure in aiding, to any extent in my power, the discovery of the cause of the deterioration of health amongst photographers.

It will be well, however, to endeavour to prove, in the first place, that the practice of photography as a profession is destructive of health; and here I am anxious to make myself rightly understood. I do not mean to assert that photography cannot be entered or carried on as a profession without suffering in bodily health; on the contrary, I believe that if the matter is well understood, and care be taken, any injurious effects may be avoided; and, having suffered, my own case is a proof that it is possible to recover. Hence the importance of some attention being given to the subject. I believe, too, it will be found on inquiry that a considerable number have suffered in a very similar manner to myself and the cases mentioned last week. I know personally of three or four such cases, and will endeavour to obtain a statement of the symptoms and any interesting particulars. If all whose attention may be called to the subject from this correspondence will record their experience, it may lead to some practical result. The medical gentleman who attended me in my illness (and who is very eminent in his profession) is much interested in such cases, and will be glad to obtain any reliable information on the subject.

My own opinion is, that the ill effects cannot be attributed to any one chemical agency, but that they are the result of breathing for several hours every day an atmosphere contaminated with noxious fumes arising from the collodion, developer, and, in some cases cyanide, to which may probably be added, absorption of poisonous substances through the skin, when the system has been already debilitated from over work, both of mind and body. You remark, very truly, in your note to "A Sufferer's" statement, that "the symptoms described are too common outside of photography." "Any occupation which overtaxes the nervous system, induces sedentary habits, and especially which occasions irregularity in taking food, may induce, in a delicate constitution, all the symptoms mentioned, quite apart from photography." But I feel convinced that these symptoms are very much aggravated in the case of photographers. True, in all the cases with which I am acquainted the system has certainly been overtaxed. There is a very great temptation to this in the case of any one who is very fond of the pursuit, and has also to make his living by it. He is never satisfied with the result he obtains; each improvement only makes him more anxious for higher attainments; hence many hours are spent in thought and experiment; and then, when rest is required, there is the work which must be done. The result is, that exercise in fresh air is neglected, and work continued to unreasonable hours. Meanwhile, the excitement and pleasure afforded by the pursuit blind him to any symptoms of injury to the constitution until it is almost too late for recovery; too late, at least, for care and exercise alone to effect a cure. Indigestion, wind spasms, violent colic pains, extreme nervousness, and something like local paralysis are induced, until the sufferer is brought to such a state of weakness as to be unable to digest any solid food. So violent at times is the pain, that the sufferer is convulsed, and symptoms not unlike poisoning by strychnine produced. The face assumes a leaden hue, the limbs become rigid, with the hands tightly clenched, and the back arched, so that the body rests on the back of the head and heels. But is it possible that this can in any way result from the practice of photography? I can only answer that such has been my experience since I became a photographer; and although not of a very robust constitution previously, I had never suffered in like manner. Whilst I continued at work I could obtain no permanent relief; but

Proceedings of Societies.

OLDHAM PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of the above Society was held on Thursday, February 27th, the President, Mr. JOHN GREEN, in the chair.

After the minutes of the last meeting had been passed,

Mr. J. R. HENTON said that he was not quite prepared to read his paper "On Outdoor Photography" that night, but hoped to be ready against the next meeting. He would therefore read an extract from the PHOTOGRAPHIC NEWS, on a visit to M. Salomon's studio; it might prove interesting to those who had not read it.

after a few weeks' residence in the country and entire cessation from work the symptoms entirely left me, and I gradually recovered strength. With one exception, I have had no return, as I now content myself with leaving the manipulations to an assistant. The exception to which I refer occurred last spring, when I was left without assistance at a few days' notice. A fortnight's work in the dark room was again sufficient to bring on most of the symptoms I have described, although not so violent. A fortnight's rest in the country again recovered me; and since that time I have continued to enjoy sound health.

I venture to think, therefore, that my case is somewhat conclusive in pointing to the inhalation of the noxious fumes as a very great aggravation, if not the cause, of the suffering. I ought, perhaps, to say that my manipulating room is by no means small, and is provided with considerable ventilation.—I am, dear sir, yours very truly,
J. M. BURGESS.

"PHOTOGRAPHY AND DISEASE."

DEAR SIR,—The two letters printed in your article of Friday last under the above heading seem to me to require notice, as apparently having an interest for all engaged in the practice of our art. At the same time, your own remarks thereon are at once so true, so judicious, and I had almost said so exhaustive, as to leave little to be desired, save that corroboration or otherwise to be obtained from the opinions or experience of other practical authorities.

As a photographer of very long experience, and also as having been originally educated for the medical profession, I may, perhaps, venture to give my opinions for what they may seem worth. Of experience in any cases of injury to health in any way attributable to the use of our ordinary chemicals I am happy to say I have had none, either in my own person or in those of my somewhat extensive list of friends and acquaintances, professional and amateur, largely or in a smaller way practising photography.

I will commence with the second of the letters in your article, as containing the more definite statement. In this, the writer (referring to chloride of silver as the supposed cause of his ailments) seems to forget that but little of that salt is present in the "washing waters," they containing chiefly—and, in the case of soft (rain) water being used, entirely—the nitrate in solution; and if any effect be produced on the system, it must surely be by the soluble, not by the insoluble, compound. It is a rule admitting of scarcely an exception, in therapeutics, that the activity of a body introduced into the system depends on its solubility, either in water (e.g., iodide of potassium) or in the juices of the alimentary canal, as carbonate of lime, though *per se* insoluble, is dissolved by acid in the stomach; or, in a third case (an example of which may be found in mercurial inunction), where the metal, in a finely divided state, is, by application to the thinnest portion of the skin in combination with fatty matter, made to effect an entrance into the animal economy. So also many solutions are now used by hypodermic injection (*i.e.*, are forced into the cellular membrane underlying the cuticle), and so become absorbed, it not being found by any means sufficient, even in the case of soluble salts (e.g., acetate of morphia), to apply them to the unbroken skin. This would seem to dispose of the supposition of the effects complained of being due even to the nitrate, the soluble salt, of silver. And I would further remark, as to the frequent use in surgery of the solid nitrate as a caustic to extensive sloughs and raw surfaces of every kind, no instance of deleterious effect is on record from such procedure. Of course the question must be looked at in two aspects: Does the silver in any form find an entrance into the system? and, if so, Does it produce evil consequences? The first question I should be inclined to answer in the negative; and, for still stronger reasons, to be stated presently, I say "No," to the second also.

Nitrate of silver, and the oxide also, are favourite (and in many cases I have known them to be effectual) remedies for certain forms of obstinate dyspepsia, they being administered in the form of pills, in doses of a grain or more, once or twice daily; the only evil, so far as I am aware, attending their employment being the liability to discolouration of the skin, which is often permanent, arising obviously from the silver entering the fluids of the body, and being so conveyed to the surface. Sir Thomas Watson, in his admirable "Lectures on

the Principles and Practice of Physic," mentions these remedies; and, if my recollection serves me, he says that of several cases of discolouration which have come under his notice, more have followed the use of the oxide than of the nitrate, clearly showing that the nearly insoluble oxide must have been taken up by the fluids of the stomach; and yet no mention is made of any further deleterious effect being produced.

Dr. Alderson, the accomplished President of the Royal College of Physicians, in his Lumsian Lectures, delivered at that College in 1852, "On the Effects of Lead on the System," mentions various methods in which that highly poisonous metal may be introduced into the blood; and in every method detailed by him—such as the contamination of drinking water, the diffusion of minute particles in oily matter, or as finely divided dust, carried into the lungs—the principle I have mentioned is evidently borne in mind. I think, therefore, that it is a fair inference, from the first of these authorities, that silver has no such effect as supposed by your second correspondent; and, from the latter, that it must be soluble salt, if any, which is the "*fons et origo mali*."

With regard to the less definite accusation against any particular chemical, as contained in the first of the letters, I am disposed to agree with you, that such symptoms are "too common outside photography." It may well be that your correspondent is not too careful, if working large plates, to avoid inhaling the highly-stimulating vapours of ether and spirit necessarily given off during coating; and in that case it is not unreasonable to suppose (indeed, I have myself experienced it occasionally) that a degree of reaction may follow the stimulating effect, and these two states, if continued, may produce, by their alternate action, forms of dyspepsia and hepatic derangement similar to those produced by indulgence to a great extent in spirituous liquors.

You have touched on one too probable cause of derangement, viz., irregularity in taking food. I know this is often a source of trouble to the class "operator," and well do I remember at one time being grudging even a quarter of an hour for luncheon and rest during the most fagging work, and at a time when, with one assistant, I was taking for the generous employer forty portraits or more in a day. Such men little know how they are in every way defeating their own dearest object, money-making; for I hold, even on physiological grounds, that the man who has an interval of rest and needful refreshment as a break towards the middle of the day, returns with renewed vigour and zest to his work; and if he be fortunate enough to have engaged with a man who values his services, and who will not cast him adrift as soon as the busy season wanes, his continuance in health is a matter of interest to his employer as well as to himself. Still, to the disgrace of many gentlemen, this and other matters of kindness and consideration to those with whose services they cannot dispense, and for whose work they take credit as their own, is a point utterly ignored.

Before concluding, one word as to a far more likely chemical to be in fault, viz., the chloride of gold, an agent more active in the system than even bichloride of mercury—abundantly soluble, readily absorbed. It was at one time (*Lancet*, November, 1852) mentioned as a remedy in scrofula; but, from the care mentioned as necessary to be observed in its administration in small fractions of a grain, it is evidently thought by those most conversant with its effects to be a dangerous remedy. How, then, may it not be liable to affect some of us? Most of us are more prone to dip our fingers into the "toning bath" than into any other solution, and doubtless this is not unattended with risk.

I remember, when having met with great success in using Hardwich's citrate of soda toning, some ten years since, I introduced the plan in an establishment, one of the printers cautioned another as to its use, saying that one of his acquaintances had been laid by with sores on the hands and arms through its employment. I did not see the case myself, nor have I ever met with a similar one since; but it shows the need of care. No doubt, from long habit, one gets indifferent, and runs risks; but by the use of proper precautions the actual contact of most of our chemicals with the skin may be obviated, or reduced to a minimum.

Apologising for the length of this note, and hoping it may reassure your correspondents in some measure, I am, dear sir, faithfully yours,
GEO. ROBT. FIRT.

HEALTH VERSUS CHEMICALS.

DEAR SIR,—In the PHOTOGRAPHIC NEWS of last week I find two photographers ask as to their causes of suffering, and are inclined to attribute their illness to one or other of the chemicals they use.

Next to cyanide I believe there are no worse chemicals in general use than methylated ether and alcohol, with the free iodine usually found in many of the collodions now manufactured. These are quite sufficient to cause anyone who has many plates to sensitize to feel very unwell, unfit for work, and inclined to be careless about other manipulations. Some guide-books actually advise that dirty plates should be cleaned with old collodion with an addition of iodine. This, I know from practice, is most injurious to the eyesight, as well as hurtful to the health of those who inhale methyl and iodine. I usually coat my plates in a glass studio, and then take them into the dark room to place in the nitrate bath, covering the bath over with a brown paper cap, and not shutting the door of the room until the plate is ready to take out of the bath. Even with this large space to work in, I am constantly told, when away from work, that I smell horribly of collodion: to such an extent does the vapour impregnate everything that comes in contact with it, and, of course, the breath also.

When, formerly, in the habit of buying my collodion ready made, I almost thought I must give the fine art up, in consequence of the effect the effluvia had on me; since then I have generally made my own collodion, and advise all others to do the same. My manufacture is not quite so sensitive as some I can purchase, but I find it does not injure my health when pure spirit is used. It answers much more surely for dry plates, and my nitrate bath now keeps in good working order double the time it formerly lasted. It is also cheaper to make collodion from pure spirit than to buy methyl collodion.

The receipt is most simple. The only difficulty is in procuring good pyroxyline, if you do not make that also. In making collodion, never use from one sample of pyroxyline only, but take from a mixture of at least half a dozen different lots, so as to make an average.

Plain Collodion.

11 ozs. pure ether at 4s. ...	2s. 2d.
10 ozs. pure absolute alcohol at 5s. ...	2s. 6d.
150 grs. pyroxyline at 2s. 6d. ...	0s. 10d.
	5s. 6d.

Iodizer.

7 ozs. pure alcohol, S12 at 4s. 6d. ..	1s. 7d.
84 grs. iodide cadmium } 161 grns. ...	
42 grs. bromide cadmium } at 1s. 9d. ...	0s. 8d.
35 grs. iodide ammonium } (say) ...	
	2s. 3d.

Total cost of 28 ozs. collodion ...	7s. 9d.
Or 5s. 6d. per pint of 20 ozs.	

Add a few drops of tincture of iodine to the collodion before using—just to make it a straw colour—and it will keep good for many months. M. W. J. S.

Lavender Hill, Wandsworth, March 2nd, 1868.

PS.—The plain collodion to be drawn off with a syphon, so as to be clear of sediment; and the iodizer to be filtered through paper.

COMMON WATER FOR NITRATE BATH.—PERMANGANATE OF POTASH.

SIR,—As there has been some correspondence lately on the use of common water for photographic purposes, perhaps a few remarks may not be amiss from one who, like Mr. N. K. Cherrill, has proved that distilled water is not at all necessary for any of the baths or other solutions used. From the commencement of the collodion process I have never used any other but common water for developing solutions, &c., and for some years have used only common water for the negative bath. By the same plan that Mr. Cherrill recommends—viz., by adding about half a drachm of an old negative bath to about forty ounces of common water from any pump or river, then filtering, and adding the proper quantity of silver, as usual for a bath—it works well and makes clear negatives. If it should not do so on trying the first plate, a single drop of nitric acid has put all right.

In June last I was at Fountain's Abbey taking views, and, by accident, a lady's dress caught the corner of my tent and upset it, and wasted all my silver bath; and as I was four miles from Ripon (the nearest place that distilled water could be got), it was not pleasant to walk that distance and back with a bottle of distilled water; but as the bath that had been wasted had been made of common water before I left home, I saw no reason why I should not make up a bath with the water that was running close by, as I had several ounces of nitrate of silver in my box. I took a large can and went to the river and filled it, but as there had been rain the day before, the water was a little sandy and muddy. I measured out 60 ounces and placed a few crystals of silver in it; after shaking well, filtered it, and then dissolved the proper quantity of silver to make a 30-grain bath. I then tried a plate. The negative looked a little misty. No. 1 print enclosed is from the negative. I then added one drop of strong nitric acid, took another plate, which made all right. Nos. 2 and 3 prints were taken after this drop of acid had been put in the bath. I will leave you to judge whether they are or are not as clear as though they had been from negatives done in a bath made with distilled water. I may say that I took more than a hundred negatives after these, in the same bath, and all worked as well.

It may be said that in another part of the country the nearest river water would not work so well. All I can say is, I have never met with a failure in that direction, and I have worked in almost all parts of England, taking views. I also have used the water that runs in the rivers through the valleys in Switzerland with the same good results; but, in nine times out of ten, simply taking the proper quantity of water and adding the silver will make a first-rate bath, even without filtering; but should there be any signs of milkiness, then filtering will be necessary.

I have been trying the permanganate of potash cure for an old, foggy bath, and find it to answer for that purpose better than anything I have ever tried before. I enclose you some prints to show the difference before and after the addition of the permanganate. This bath, that the negatives of these prints were taken from, was one to which cyanide of potassium had been added, but would not cure it. Carbonate of soda had been put in it and sunned for two days in very bright sun, then it would not work without fogging the negative. I then got a little permanganate of potash and made a solution of 20 grains to the ounce, and added as much as made the bath the colour of dark sherry, which remained that colour for about ten minutes; it then gradually began to turn brown, and went on in that direction for about two hours. I let it stand about another hour, and a rusty-looking deposit began to go to the bottom of the bottle. I then run it through a clean filter, and it filtered as clear as possible. I then tried a plate, and it made a negative in every respect as clear and as good as any new bath would in the best of conditions, and with only one application of the iron developer, which, it will be as well to say, was made with sulphate of iron 20 grains, sulphate of copper five grains, glacial acetic acid one ounce, spirits of wine half an ounce; the time of exposure was about the same as with a good new bath. Perhaps, Mr. Editor, you will examine the prints done before and after the addition of the permanganate of potash, and state how far you think it has accomplished the object.—I am, sir, yours truly,

GEORGE WILLIS.

32, St. Nicholas Cliff, Scarbro', March 2nd, 1868.

[The examples enclosed fully illustrate our correspondent's statements.—ED.]

Talk in the Studio.

PORTRAITS A LA SALOMON.—We have just received some exceedingly fine examples of portraiture from Mr. Notman, of Montreal, treated after the manner of M. Adam-Salomon, and in many points resembling them. We shall have more to say respecting them shortly.

ENAMEL PHOTOGRAPHS.—We recently had an opportunity of examining some of Mr. Jonbert's photographic enamel miniatures produced by a modification of his patented process. The results are admirable, soft, round, and delicate, yet lacking nothing of vigour, and many of them excellent in colour. Mr. Henderson recently exhibited some very promising specimens by a process he has recently worked out, the details of which

he does not make public. We believe that there is a more extended popularity in the future for this kind of photograph than it has hitherto obtained.

CURIOUS CAUSE OF WEAK PRINTS.—A correspondent calls our attention to a singular cause of flatness and weakness in prints. An example recently sent to us had the appearance of having been produced from a weak fogged negative, but was, we were assured, obtained from a very vigorous negative. He now explains the cause as follows:—"You will perhaps remember that some weeks ago I sent you a print, on roller, of group of lady and boy, asking you if you could tell me the reason of the want of force it showed. Not having seen the negative, you attributed the fault to that being fogged, or some other fault that you thought belonged to the negative. I have since obtained brilliant prints from the same negative, and have discovered the cause of the badness of several prints that were made at first, and were like the one I sent you. My brother, who had made the prints, to prevent the paper cockling, had dried the cloths, &c., which formed the packing, and had put them on the paper while still warm, and thus spoilt the print."

SUGAR IN THE PRINTING BATH.—A correspondent, J. S. W., sends us an example of the value of sugar in the printing bath, with the following note:—"Having derived much valuable information from your pages, and as you request points of practice, I enclose you a bit of paper sensitized three weeks ago, and a print taken on some of the same paper, and as dark before toning. The bath had sugar in it, as recommended by Mr. Bevey, to whom many thanks are due, but who would hardly recommend so severe a trial as to its result. You will judge for yourself." The enclosure is an interesting picture, and a good print.

To Correspondents.

C. E. F.—Condy's fluid is a solution of permanganate of potash, containing, we believe, about 20 grains per ounce of the salt. It may be used for removing organic matter from either printing or negative bath. A more dilute solution will, however, be safer to use. See an article on the subject in our present number. The same instructions are applicable to the printing bath. Permanganate of potash may be obtained of most chemists. 2. The enamel paste with a basis of wax like that referred to may be obtained ready for use of various dealers in photographic materials. Newman's enamel paste answers well. You may prepare such a material yourself by dissolving pure white wax or paraffine in an essential oil, like that of lavender, in proportion to make a stiff paste.

ACID GOLD.—The object of neutralizing chloride of gold for toning purposes is to secure a condition in which the gold will be readily thrown down on the print. When excess of hydrochloric acid is present, it is often difficult to secure satisfactory toning action. If you secure good toning results with an acid bath there is no reason why you should not use it; but it is important in such case to rinse the prints very thoroughly before immersing them in the fixing bath, as otherwise the acid in the print would decompose the hypo, and cause sulphur toning.

W. J. A. G.—The waterproof fabric you enclose will answer well for covering a tent; but it will be desirable to have an arrangement in a tent so covered for ventilating purposes. 2. The price of the *Philadelphia Photographer* is 50 cents (2s.) each monthly number. 3. We have seen so called "instantaneous" pictures produced on dry plates; but they were not what we should term good. The term is, of course, purely relative; we hear many things in photography called good which are, in our estimation, very inferior indeed. We have taken instantaneous sea views on Dr. Hill Norris' extra rapid dry plates, which were pronounced "good for dry plates," but which were poor when judged by a standard of excellence attainable on wet plates.

C. M. (Rennes).—We have carefully tested the mounting cards of the stereo prints, and do not detect the presence of hypo or other sulphur compound. After a careful examination, we can only come to the conclusion that, owing to some oversight in the manipulation, or some impurity in the hypo, the prints were imperfectly fixed, and contained, after finishing, insoluble hyposulphite of silver, which decomposed under the action of moisture and light whilst mounting. 2. The cracking of the negatives of which you send example seems most probably due to damp acting upon some trace of a hygroscopic salt left in the film, either by imperfect washing, or from washing in water containing traces of some such salt. Rubbing with very finely powdered charcoal on a tuft of cotton-wool will fill up the cracks considerably, and

sometimes permit of the production of a tolerable print from such a negative.

COMO.—For direct sun printing with the solar camera, without development, a similar process may be used as for ordinary printing in the pressure-frame. If the paper be prepared expressly for the purpose, a strong solution will increase sensitiveness; about 15 grains of chloride of ammonium to each ounce of albumen may be used, and a silver bath of 80 grains to the ounce. For development printing with the solar camera, 8 grains of bromide of potassium, 4 grains of chloride of ammonium, and 3 grains of gelatine in an ounce of water form a good salting solution. This paper may be excited on a 60-grain silver bath containing about 5 drops of acetic acid.

D. M. A. (Montrose).—There are several modes of taking several images on one plate; whether yours is new or not we cannot, of course, tell you without knowing the details. The expense of protecting the method, if new, would be somewhat heavy, as it could only be secured by patent, which would cost upwards of £50 for the first three years, and between £200 and £300 for the whole term a patent can run; namely, fourteen years.

WALTON ADAMS.—Mr. Werge, at Mr. Hughes', 379, Oxford Street, is a clever Daguerreotypist, and he will probably undertake a commission to clean and recolour a Daguerreotype for you.

OBEDIENT SERVANT.—Thoroughly damping the engraving all over before mounting it, and also damping the mounting-board, will doubtless remove the cockling which exists. After mounting, let the mounted picture dry under firm pressure.

G. STEWART.—The excited samples of paper, after exposure, give such stains as you describe; the pieces which we excited did not, but there were a few spots of discolouration. Nevertheless, we are inclined to believe that the fault is in the paper. We notice that, on removing it from the silver bath, it possesses an offensive smell of sour and decomposing albumen. It is probable that the paper has been kept in a damp place, and some decomposition in the albumen set up.

W. G.—The singular and polychromed bronzing which remains after toning and fixing is unusual, and we cannot certainly indicate the cause. The use of a weakly salted paper and a strong silver bath with negatives possessing much contrast is a common cause of bronzing. Try the use of a weaker silver bath.

A PROVINCIAL PHOTOGRAPHER.—For enlarging by means of artificial light an ordinary magic-lantern condenser will answer well. A combination formed of a double convex and concavo-convex in contact will serve your purpose. If you apply for a magic-lantern condenser, instead of for a condenser for enlarging, you will receive the right thing.

NOVICE.—Undoubtedly a coloured transparency of a painted glass window will do it more justice than an ordinary paper print. 2. A very roughly coloured print, taken on the spot, will serve as a guide for the colourist. 3. Your doublet will answer well for the purpose; but we cannot possibly give you any idea of the exposure necessary, as so much depends on the light, the colours in the window, &c. You can only ascertain certainly by experiment.

A. McD.—We fear that the matter is a swindle, and, if we are rightly informed, the instrument is quite worthless when supplied. You can obtain the *YEAU-BOOK* by post on sending 1s. 2d. to our Publisher.

NOVICE II.—Alcohol performs no office in the developer beyond making it flow freely over the plate. Methylated spirit will answer perfectly.

REV. A. S. (Devizes).—The description in question is published in two numbers of the *PHOTOGRAPHIC NEWS*, October 18th, and November 8th. In our experience, and that of the majority of our friends, the process answers perfectly if the plates are used within a week after their preparation. The best commercial dry plates we know are those of the Liverpool Dry Plate Company. We have never met with a failure even after long keeping.

BEGINNER.—It is probable that increasing your north light and removing the south light will give you improved results, as you suppose; but the lack of definition in the enclosed print is not, we think, due to imperfect illumination. It is probably due to the use of a lens with short focus with too large an aperture. Try inserting a smaller stop, and send us another example.

COLLODION.—It appears probable that you had over-iodized your bath; and diluting with distilled water, filtering, and then strengthening will prove a remedy. 2. Better try the morphine alone. In the majority of hands, it has answered well. That, or Mr. England's process, will probably best serve your purpose. 3. *Rive* paper gives the most brilliancy, and is most suitable for soft negatives; *Saxe* paper gives the most softness, and is suitable for hard negatives. For good negatives, we prefer *Saxe*.

BONA FIDE and several other Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
The London Photographic Society	121
Keeping the Nitrate Bath in Order.....	121
Simple Method of Waxing Prints	122
Restoring an Old Bath with Permanganate	122
Foreign Miscellanea	122
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	122
On the Cause of Deterioration of Prints Mounted on Cardboard, with Gilt Borders. By MM. Davanne and Fordos	124
Pictorial Effect in Photography. By H. P. Robinson.....	125
M. Braun's Collodion.....	126
Acetate of Lead in the Printing Bath.....	127

	PAGE
A Good Keeping Collodion. By W. J. Land	127
Enlarging by Magnesium. By J. Solomon	127
Removing Varnish from a Collodion Film without Injury. By V. J. Bloede, Chemist	123
Proceedings of Societies—North London Photographic Association—London Photographic Society	128
Correspondence—The Coffee Process.—Rectifying Baths—"Photography and Disease"—Mr. Anderson's Enamel Process—To Touch, or Not to Touch	129
Talk in the Studio	131
To Correspondents.....	132
Photographs Registered	132

THE LONDON PHOTOGRAPHIC SOCIETY.

The conviction we recently expressed as to the vitality of this Society received satisfactory confirmation at the meeting held on Tuesday evening last. An excellent paper by Dr. Mann, on "An Amateur's Difficulties in South Africa," and the discussion thereon, engaged the greater part of the evening, leaving no time for a further communication from Mr. J. R. Johnson on the use of permanganate in rectifying disordered nitrate baths. Amongst other interesting objects shown, we may especially note some exceedingly fine portraits after the style of M. Adam-Salomon, exhibited by Mr. Fradelle and by Mr. S. Fry, the pictures of both gentlemen possessing many of the characteristic qualities of force and chiaroscuro belonging to those of the great French artist.

But good papers, interesting discussions, and fine examples of photography have not been rare at the Society for some time past; and it is to a gratifying announcement made by the Chairman we especially refer, as illustrating the vital interest taken in the Society by its leading members.

Mr. Reade announced that, to aid in giving a new impulse to the Society, Mr. H. P. Robinson had volunteered to produce during the year an especial subject-picture for the Society, and present each member with a print. Mr. Henry Claudet had undertaken to present each member with a print from the last negative taken of his father, the late Mr. Claudet, the portrait having the additional interest of having been produced by the topaz lens which Mr. Claudet had recently had made. Mr. H. Claudet here happily illustrates his own cordial feelings towards the Society, and confirms the statement we recently made, by his desire, as to the absence of any feeling of antagonism between his late father and the Society. Mr. England had also undertaken to produce, during his summer tour, an especial negative, for the purpose of presenting prints from it to the members. It is probable that the pictures of the two first-named gentlemen will be ready for presentation some time this year; that of Mr. England may possibly be delayed until the beginning of next year, as the opportunity for producing such a picture as Mr. England may desire for the Society can only be taken in such part of the season's tour as may be suitable. We congratulate the members on the promise of three such pictures, and we echo the statement of the Rev. J. B. Reade from the chair, that such offers from such gentlemen prove, "in spite of the breezy little notices got up from time to time intimating that the Society was going down, that its motto was still *Excelsior*."

KEEPING THE NITRATE BATH IN ORDER.

We are indebted to Mr. Rejlander for a practical suggestion for the preservation of the nitrate bath, which seems as philosophical as it is, he informs us, efficient in practice.

Reflecting recently on the causes of fog, stains, and other troubles arising from the condition of the bath, he arrived at the natural conclusion that they were due to the presence of bodies with an abnormal tendency to reduction. The nitrate bath, he argued, should not contain anything which is in itself sensitive to light, or anything which is readily reduced by the action of a developer, except in those parts forming the image. The plate, when it leaves the bath, should contain nothing which will be readily reduced without the action of light, and where light has not acted reduction should not readily take place. That, of course, is a proposition familiar to every photographer who attaches due value to clean shadows. These conclusions arrived at, Mr. Rejlander resolved to employ light as the touchstone of the condition of the bath and the remedial agent at the same time, commencing to remove the evil as soon as it indicated its presence. As the nitrate bath should not in itself be sensitive to light, nor contain substances so sensitive, he resolved to use light as a detector of the presence of any intruder in the bath; and instead of sunning his bath occasionally to get rid of such intruder, he resolved to do it constantly, to detect the first approach, and eliminate the first appreciable accumulation, of organic matter. In short, opposed to all old rule, he keeps his nitrate bath constantly in daylight when not employed in sensitizing plates. Whenever any foreign substance which combines with silver or tends to reduce its salts is present, the action of light will reveal its presence by the discolouration and turbidity which will ensue, and it will, at the same time, commence its elimination by reducing it, so that it may be removed by filtration. Mr. Rejlander states that he has now been trying the plan for some little time with complete satisfaction. When he finds a bath discoloured by the action of light, he knows, of course, that it is not fit for use; but by constantly keeping his baths in the light, the work of elimination going constantly on, filtration generally removes the matter thrown down by light, and he always has a bath in perfect condition, yielding him brilliant and clean negatives.

There is the possible objection to this method that light will aid in setting up injurious decomposition in the organic matter accumulated in the bath, which might otherwise for some time have remained inert, producing no injurious effect by its presence. This argument will, however, be chiefly of weight against the use of the bath in an intermediate condition, when light has acted sufficiently to initiate decomposition without completing the reduction. Other objects may arise in the course of extended experience; but, in the meantime, the suggestion seems valuable, and is worth a trial. In the early days of the collodion process the strictest care was enforced as to the preservation of the nitrate bath from even a passing gleam of light. Since then sunning has become a recognized remedy of the utmost value for an old disordered bath; and it is possible that the continued action

of light may aid in the constant elimination of the gradual accumulation of such bodies as produce fog or other abnormal reductions.

SIMPLE METHOD OF WAXING PRINTS.

MR. BLANCHARD has called our attention to a simple method of waxing prints, which he has been practising some time with great success, and which he finds quite as effective, with much less trouble, than the ordinary method of employing enamel or encaustic pastes in the usual way.

Instead of employing white wax, which is frequently adulterated with fatty bodies and so rendered comparatively worthless or absolutely injurious for finishing photographs, he takes common bees'-wax and dissolves it in benzole, making a solution of about the thickness of cream. From two to three drachms of bees'-wax dissolved in an ounce of benzole we find, by experiment, gives about the right result. This is smeared all over the face of the print, the benzole evaporating almost as quickly as the preparation is applied. It is then polished by means of brisk friction with a clean cloth; we find that a silken fabric answers best. The result is a rich depth in the shadow, more detail in the lights, and a waterproof surface which will materially protect the picture from various injurious influences. After this treatment the surface is hard and firm, and does not readily mark with handling; and if it eventually becomes dull, dusty, or a little marked, brisk rubbing with a piece of clean cloth restores the polish. Mr. Blanchard finds that this mode of finishing the prints is quite available commercially: a couple of girls engaged on the work, one applying the wax and the other giving the polish, rapidly get through a large number of pictures. The tint of ordinary bees'-wax does not communicate any perceptible colour to the prints.

RESTORING AN OLD BATH WITH PERMANGANATE.

WE have within the last few days applied the permanganate remedy to an old bath sent up to us a few weeks ago by a correspondent for examination. It consisted, according to the description, of a mixture of an old bath which had been evaporated to dryness, and redissolved in distilled water, with an equal bulk of a new silver solution. Such a mixture might have been expected to work well, but it did not. It was described as giving streaks and other markings which could not be got rid of. In our hands, although the streaks were absent, it yielded a thin, poor negative, with a grey, foggy deposit, not loosely on, but in, the film. The result was the same with two or three samples of collodion.

In this instance we employed Condyl's fluid, which is accessible to all our readers, being sold by most dispensing chemists, who rarely keep the salt in crystals. To six ounces of the nitrate solution about twelve drops of Condyl's fluid were added, the solution being briskly agitated. The purple tint at first produced gradually changed—in about five minutes—into a grey, and in about a quarter of an hour all purple or pink tint had disappeared, a light-brown coloured turbidity only remaining, which was filtered out, and a plate was tried in the solution. A vigorous image, but slightly veiled, was the result. As the solution was quite neutral when tested with litmus paper, a drop of nitric acid was added, and another plate tried. The result now obtained was a perfectly clean and vigorous negative, dense, and with a fine bloom in the lights, and absolutely clean and transparent in the shadows.

To a small portion of the original solution we added the permanganate solution in a much larger proportion. This was several hours before it lost the pink tint; the precipitate, which was of darker brown than before, was found, on examination, to contain permanganate of silver mixed with the sesqui-oxide of manganese; thus illustrating that the addition of excess of the permanganate only issues in waste of silver.

Foreign Miscellanea.

PHOTOGRAPHING COAST SCENERY FROM THE SEA.—M. Julius Kruger, of Stralsund, publishes in the *Photographische Correspondenz* a very interesting paper on photographing coast scenes from the sea. He has secured some very charming views of Sassnitz, a small watering-place in the island of Rugen, and he has been led, by the success of his enterprise, to publish the details of the method by which the pictures were produced. The principal conditions required for the production of a good photograph are perfect stillness and rigidity of the camera, and the reflection upon the ground glass of a sharply defined image. To ensure these conditions it was impossible to work from a boat or raft, as even during the finest weather the same would be subject to slight oscillation; M. Kruger, therefore, constructed a large tripod-stand composed of three masts, each measuring thirty feet (the depth of the sea at the point selected for operating), and these, having been firmly braced together and loaded with a few heavy chains and weights, were lowered at the desired point, which had previously been marked by a small buoy. The camera was fixed to the top of this stand, and a small row-boat, provided with a dark tent and the necessary appliances, contained the operator. At first, great difficulty was experienced in exposing the plate, as the boat was continually drifting away from the camera; and it was impossible for the operator to hold on to the stand, or to keep the boat in position by rowing, as either mode of proceeding had the effect of shaking the camera. By mooring an anchor at the prow and stem of the boat this difficulty was overcome, and, by the employment of a very small diaphragm, the picture did not suffer any injury from an exposure of two or three seconds more or less. M. Kruger believes that it would be quite possible to work in water of much greater depth, although it may be assumed that in most cases the sea is never much deeper than thirty or forty feet in such close vicinity to the shore.

PHOTOGRAPHIC ENTERPRISE IN AUSTRIA.—In the same journal is published a computation of the number of carte-de-visite photographs which have been produced in Austria during the past year, and which shows that photographic trade is by no means at a stand-still in that country. Half a million dozen of pictures is the supposed number, which, calculated at three florins per dozen, would give a total of a million and a half of florins received by Austrian photographers.

SECURING FIRM FILMS.—At a recent meeting of the Berlin Photographic Society some discussion took place as to the best method of producing a firm, adherent collodion film. Dr. Vogel gave it as his opinion that the quicker the solvent evaporated the firmer would be the film, and it is for this reason that better films are obtained in summer than in winter. He suggested that collodion manufactured for winter use should contain an additional quantity of ether. M. Grune believed that a rotten film was the result of employing collodion prepared with imperfectly-washed gun-cotton which had been treated with alkali.

PHOTOTYPES.—The *Photographische Mittheilungen* contains a capital engraving, said to have been produced from a plate from which 30,000 copies had previously been struck off. It is a so-called phototype, and is a reproduction of a pen-and-ink sketch; it was produced by the process of MM. Burchardt Frères.

PHOTOGRAPHIC RELIEF FUND.—Both the Berlin and Hamburg Photographic Societies have been endeavouring to establish a fund for the benefit of photographers' widows, but, unfortunately, up to the present time without success. Meanwhile, the formation of a mutual assurance society is contemplated.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

REMARKS ON PHOTOGRAPHIC PAPERS, ETC.

MEASURED by its rapid growth, or the precocity that has characterized its every stage of development, photography has no parallel. Although its existence in a practical form scarce reaches thirty years, yet its history admits of distinct

divisions: First, the era that was inaugurated by the renowned Daguerre; second, the revolutionary advent of collodion as a photographic agent; and it might be recorded, as an interesting fact, that a worker of Archer's invaluable process, whose experience dates beyond some half a dozen years, numbers with the pioneers whose exquisite skill and undaunted perseverance have elevated the art of photography to a position of importance, which finds a ready recognition among all classes of society.

The rage for stereographs which for a time ran rampant did much towards popularizing the art, but it is to the carte mania that photography is indebted for the proud position it has since attained. No sooner was that style of portraiture in miniature form introduced, than the public, enamoured with the novelty, eagerly crowded the photographers' studios. A race for excellence was the result; and experimentalists joined heart and soul in searching out the conditions requisite to secure the maximum of sensitiveness, delicacy, brilliancy—in a word, perfection. In pursuit of these the indefatigable explorers laboured unceasingly; nor did they prospect in vain, as the objects sought were speedily discovered; and had the discoveries which enabled all that was needed in the production of a negative to be held in subjection been supplemented with some satisfactory contrivance by which the positive proofs would be mechanically reproduced on a paper surface, photography, apart from the demands of educated art, might have been pronounced a perfect success. But it unfortunately happens that from the birth of the collodion process a hydra-headed difficulty has presented itself, in the fact that the picture so delicately and beautifully traced in the collodion film cannot, with freedom from the elements of uncertainty, be satisfactorily impressed on paper; and as the problem of unswerving success still remains an open one, the reason of failures and the means to overcome them are the questions on which I now enter; and the first in the order in which I propose dealing with each subject that presents itself being paper, that of paper I now, without further digression, proceed to discuss; and as I am desirous of being understood by all readers, I shall here dismiss the rules that belong to strict composition, and write as if I were engaged in friendly chat.

My troubled reader, I have listened attentively to the numerous failures you describe, and which you attribute to "that abominable paper," and, by way of consolation, my endeavour will be to remove the erroneous impressions which have found a harbour within your bosom. You say you are unable to get at the tone you aim at; your pictures are weak, washy, and mealy; in every sense of the word miserable failures; and, as a slight relief from your troubles, you thrust the bulk of your difficulties on to the shoulders of the paper dealers. Stay, friend! suspend false reasoning whilst I endeavour to set you on a better and more reasonable track. You will doubtless admit that the object the dealer holds chiefly in view is to secure customers, and however dishonest in the core a dealer may be, self-interest whispers in his appreciating ears, "Get customers; and when, by advertisement allured, to retain them in these days of trying competition you must keep and supply the best possible article." And the anxiety to observe this sensible advice is made evident by the improvements which of late years have been effected in the manufacture of photographic papers by continental manufacturers, who, for once, have distanced Albion, and have left their English competitors far behind; so far, indeed, that the papers which are chiefly—I might say invariably—employed for direct photographic printing are purchased in the continental markets, and are recognized as Saxe papers when procured from Germany, and Rive as manufactured in France. Both kinds, by separate workers, are made special favourites, because their varying qualities meet the variable demands of negatives that differ in their printing qualities. Saxe papers, being of a soft, porous nature, are proved best adapted for printing from vigorous negatives that need the

softening influence exercised by the paper named; whilst for feeble negatives the Rive papers are found most suitable for obtaining the best results, because of their hardness of texture, which renders the paper more impervious, and thus retains the picture on their surface. In my own practice, for general purposes I much prefer the Saxe papers, on account of their desirable working qualities; and the article as prepared by the celebrated Steinbach, of Malmedy, is as near perfection as I believe it possible to go.

Saxe papers have, as now made, a pleasing blue tint; Rives have a creamy hue, and the reputation of this last-named paper suffers much because of its proneness to stars and comets, which have been erroneously attributed to the proximity of the mills in which the papers are produced to some kind of iron works. The great iron works, however, may be sketched in the form of a brass or iron button, which the rag-sorters have carelessly overlooked. In justice to paper-makers, I shall find occasion, in due course, to point out an unsuspected reason of metallic blotches, which, I trust, will remove some amount of the odium from the parties usually blamed. It will be unnecessary for me to deal exhaustively with the unprepared papers by describing their varying weights and thickness. I shall therefore proceed with a description of the treatment papers undergo when handed over to the tender care of the (mis-called) "photographic paper manufacturers."

As I before observed, the point held most prominently in view by the paper preparer and dealer is to secure for use the highest class of material his money can purchase; and he takes care to examine closely every sample he purchases to satisfy himself that the texture is of the finest, the surface of the smoothest description. When satisfied with the article provided, he proceeds with the preliminary operations, which advance the paper a stage in a photographic direction. In the treatment to which the papers are submitted, two distinct principles have to be considered: first, the elements of sensitiveness which are supplied by the chloride employed; second, an organic agent must be supplied to impart stability and vigour, without which the hypo solution converts a silver print into an unsightly affair indeed. Now, as the relative proportions of the agents named by modifications exercise an influence that changes the character of the silver prints, the paper preparer has to arrange his formulæ to meet the varying requirements of his patrons. Some few years ago, when "soot and white-wash" was the facetious character attached to photographs, a highly salted paper was generally used, and consequently a strong silver solution was an absolute necessity; but at the present time, negatives by improved chemicals and treatment are more perfect, which renders a strong salted paper unnecessary; indeed, papers weakly salted have therefore become the rule, and their introduction has enabled photographers to improve the beauty of their pictures to a remarkable extent.

The desirability of paper dealers informing their customers somewhat concerning the amount of salt present in the papers they supply has frequently been urged by the editors of photographic journals. But the information would be next to useless to its recipients, who can, if they please, give a near guess without assistance, if they will examine the prints as they leave the printing-frame. The larger the proportion of chloride salt present, the deeper is the violet tint observable in the print, and the greater is the reduction in the hypo bath. A weakly salted paper prints more red on account of a large portion of the picture being composed of reduced albuminate or other organic salts of silver. The paper selected for examination should be perfectly dry, and the printing should be conducted in diffused light; otherwise the test is not a reliable one, as dampness removes the violet colour, and sunshine would, by rapidly reducing the organic salt, impart a red tint to the picture.

The chloride salts which may be employed for salting papers are numerous. Making the salt of ammonium an exception, I can see but little difference in the results pro-

duced by the remainder, if the variations in equivalents are allowed for.

I just now observed that an organic substance is provided to impart vigour; but, setting aside plain salted papers, it performs a double part, its presence being necessary in keeping the picture on the surface of the paper, without which the larger portion of the delicacy observable in a good negative would be lost in the body of the paper. With reference to the question of exact reproduction, it is probable that no paper surface registers faithfully all the details seen in a perfect negative; its extreme delicacy has no echo. This is made perceptible if we compare a collodio-chloride print with its duplicate formed in albumen; but, in the absence of something better, the substance last named has been selected for the most active photographic service, and is the article well known as being the chief agent used in the preparation of photographic papers. Although an albumen may be procured from the blood of slaughtered beasts, it may be accepted, as a rule, that no paper preparer who has a sensitive nose or a reputation to preserve, will use any other kind of albumen than that procured from the freshest of eggs; and as he is compelled to advertise his wares as something special and distinct from all others, the honest dealer finds a field for his ingenuity in the varied proportions of salt admissible, which enables him to number his papers or apply fanciful names to his heart's content. And as albumen admits of admixture with water, a keen-witted paper albuminizer, who makes the running in the race of competition, may, if it so please him, advertise single, double, or treble albuminized papers with but little extra labour bestowed in their preparation. Unless the first coating of albumen is coagulated, no advantage is gained by applying a second floating; but the highest glaze is attainable by using the thickest part of the albumen. It should, however, be understood that the highest glazed papers are the most liable to blistering, which, I think, is most reasonably accounted for by attributing the cause to imperfect coagulation of the inner surface of the albumen, so that, when an influence (hereafter to be explained) is exercised by the washings that follow fixation, the albumen quits its hold of the paper, and blisters directly from.

It is quite possible to prepare a highly glazed paper without having recourse to strong albumen; in such case the pores of the paper are filled in with some neutral material—such as carbonate of lead—which is brushed on the paper, and subsequently smoothed and polished. The difficulty experienced in procuring a satisfactory paper with an enamelled surface has prevented its general use. I hope, however, that I shall shortly be in a position to pronounce the difficulty removed.

And now, in conclusion, a word to those who are sighing and longing for a self-acting paper, warranted free from failings or failures. My dear grumblers, the papers supplied to you and me, and all others, are probably by the same makers, manufactured in the same mills, and, if procured from respectable dealers, they are, photographically, prepared with the same kind of material; and the only reason why one paper is found to suit better than another is because the salting formula varies as adopted by various makers, and as you will not, or cannot, modify your mode of working to suit the paper, you have, perforce, to go the rounds of paperdom until you find an article that meets your desires. Hence A's paper just meets the wants of B, whose toning solutions are most unmerciful in its bleachings, and B is in raptures; whilst C, whose gold solution does not bleach at all, is wishing A at Jericho, and his paper with him, because of the over-vigorous lot of pictures the paper has produced; and so matters unamicably jog on. Poor paper albuminizers have more blame than praise bestowed on them, and the question arises: Why? Because our toning operations are based on false principles; because we have been straining at complications, where all should be simplicity. But, taking things as they are, why not dealers

supply papers suitable for all customers? My dear Querist, would you like to be clerk of the weather, if you were bound to comply with the wishes of all wishers? Imagine the task, and you can understand why paper albuminizers fail in their efforts to satisfy all comers. With this remark, I close the subject of paper for the present; and I may announce that my next article will be on the important subject of sensitizing solutions.

ON THE CAUSE OF DETERIORATION OF PRINTS MOUNTED ON CARDBOARD, WITH GILT BORDERS.

BY MM. DAVANNE AND FORDOS.*

M. FORDOS recently received from a photographer residing in a provincial town in France a series of *carte-de-visite* pictures, all of which had been rendered useless by the formation upon their surface of very minute black spots. Imperfections of a similar description had previously been noticed by M. Davanne, whose attention had been called to the fact by M. Dauvois; and at that time M. Davanne attributed their causes to imperfect fixing. On attention being called a second time to the subject, and assurance being given that the prints thus injured had been manipulated with the greatest care, it was deemed desirable to make an investigation into the matter.

Inspection alone was sufficient to banish all suspicion that the prints had been imperfectly washed, for if such had been the case, the hyposulphite of soda, being contained equally throughout the print, would have had the effect of injuring the picture in a more general manner; or had the damage been visible in certain places only it would have taken the form of large yellow spots, always increasing in size. The idea next suggested itself that the fixing of the prints had been incomplete, and that the hyposulphite of silver formed in the print when the latter first comes into contact with the hyposulphite of soda had not been completely dissolved out, but had resisted the action of subsequent washings. Imperfections similar to those under investigation may be caused in this manner, but in such a case the damage becomes at once apparent, and would be remarked as soon as the prints were mounted. Besides, with spots of the kind just alluded to, the print, when viewed as a transparency, exhibits opaque patches corresponding to themselves on the surface; while in the present case the colour was destroyed by the minute imperfections and the transparency of the print not interfered with.

The information given by the photographer who produced these injured prints was to the effect that with the same materials in the same batch of prints, some of the pictures produced become damaged, whilst others remained perfectly free from blemish; for this reason it was supposed that the cause of deterioration existed in the cardboard.

Following up this idea, it was thought that the cardboard might contain some minute proportion of hyposulphite of soda, a material frequently used in the manufacture of paper. At the same time, if such were the case, the hyposulphite ought to have attacked the print in a more uniform manner, for it would be distributed in solution throughout the entire bulk of the paper; and even admitting, as an extreme case, that it had become crystallized in minute particles upon the surface of the board, it is evident that the moisture contained in the mounting material would have at once dissolved these crystals, and prevented them from remaining isolated in certain places only. Again, the hyposulphite of soda introduced into the paper pulp might have been subjected to partial oxidation by the bleaching chlorides, and the traces of sulphur thus disseminated might afterwards have exerted a destructive action; it is just possible that this might have occurred, but in such a case a much larger number of pictures must have suffered, and at present we have to do merely with exceptional cases.

* Read before the French Photographic Society.

A last hint might help to solve the difficulty: the imperfections occurred only in pictures surrounded by gold or bronze borders, and not upon those ornamented with borders of a different description. It was probable, therefore, that the bronze powder was the cause of these innumerable spots, and, in order better to understand this reasoning, it is sufficient to call to mind that the method of printing cards of this kind is different to that generally pursued. The design is first printed, with adhesive varnish, upon the card from a lithographic stone, and the bronze powder is then sprinkled over it; the powder adheres to the varnish, and a design is thus produced in bronze or gold. But the paper employed is not so smooth but that it can retain upon its surface minute particles of the powder, which thus remain under the mounted photograph, and may lead to the deterioration of the print, supposing the bronze material contains any noxious matter. Now it so happens that these bronze powders are mostly composed of bisulphide of tin—that is, a compound of sulphur and tin—and this material may, from the mode in which it is manufactured, contain traces of free sulphur. To be convinced of this, it is merely necessary to rub a small quantity of the powder in a mortar together with a little water, when the characteristic odour of rotten eggs will at once proclaim the presence of sulphuretted hydrogen. It can easily be understood, therefore, that the most minute trace of powder of this description present in the pores of the paper would soon produce an injurious effect upon an object so delicate as a photographic print.

There is no doubt, therefore, that the imperfections in question are due to the cause stated above, and the attention of photographers and manufacturers of cardboard is therefore drawn to the subject. Although the consumption of mounts of this description may not be very large, still it will doubtless be interesting to many to know the manner in which photographs may be affected by their use.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER VII.

"In the study of our art, as in the study of all arts, something is the result of our own observation of nature; something, and that not little, the effect of the example of those who have studied the same nature before us, and who have cultivated before us the same art, with diligence and success."
—Sir Joshua Reynolds.

HAVING commenced this series of papers with the determination to connect all I have to say on pictorial effect with photography, and to demonstrate the application of the different forms of composition with our art, this seems a proper occasion to give a sketch from a photograph, showing in what manner the rules of art—as far as already expressed—have guided the photographer in the selection of his subject. The sketch on this page gives the leading features of a delicious little photograph of a scene in the



lake district—"Derwentwater, Cats Bells in the distance"—by Mr. Mudd. And I may point out, as a singular instance of the possibility of the photographer moulding his materials to his wishes, the fact that a landscape by Mr. Mudd is rarely to be met with the composition of which is not nearly perfect. From a large collection of his works now before me, I am not able to select more than two or three in which there is felt any want of balance, unity, and harmony; and this small minority consists of local views, or portraits of places interesting from their association, but which do not appear to have been tractable in the hands of the artist. Although the art is properly concealed, the trained eye can discover and admire the many ingenious devices he has adopted to hide a defect, to discover a beauty, or to throw more prominently forward the chief point of his subject. All have admired Mr. Mudd's charming pictures, but few have cared to enquire to what their excellence

was chiefly due, but have been content to attribute it to his perfect manipulation of the collodio-albumen process, a method of working which he has made his own, but which, notwithstanding its excellence, does not account for the skilful arrangement of his subjects. The same remarks are equally true of the pictures of Mr. Bedford. In the works of these gentlemen nothing appears to be done without a purpose. If a figure is introduced, it performs some important function in the composition, either to lead the eye, to emphasize a point, to throw back the distance, or to collect some scattered lights or darks together, by which breadth is gained and confusion avoided. If the point of view admits of a picturesque foreground, whereby an unpictorial principal object may be made into an interesting picture, it is secured; nothing seems to be forgotten that could increase the effect or help to please the eye. And as this occurs in the larger number of views taken by both gentlemen, it

cannot be laid to the account of chance, but must be the result of knowledge.

The sketch gives a very faint idea of the original photograph. It is printed from a photo-type block, by Mr. Griggs, of the India Museum. The relief was taken from a rough sketch, made experimentally to test this process, and sufficient care was not taken to produce a finished drawing, the draughtsman being under the impression that a rather coarse sketch was necessary, instead of which a drawing full of detail would have produced a very much better result. However, the photograph is in the hands of, or has been seen by, so many of my readers that this slight and imperfect sketch will suffice to recall the original to their memories; and I apologise to Mr. Mudd for presenting such an imperfect translation of his beautiful picture.

The first thing that will strike the reader of these lessons as he looks on the original is the admirable way in which balance has been obtained by the boulders in the foreground; the next, the immense distance that is felt between the foreground and the distant mountains. This effect is almost entirely produced by the arrangement and opposition of the dark stones in front. If the stand-point for the camera had been shifted a few feet either to the right or the left, a very different and much less valuable picture would have been produced. The stones in the one case would have been excluded from the picture, and the distance looked flat; in the other, the stones would have been either in the centre or on the right side of the picture, under the dark trees in the middle distance, thus having all the dark on one side of the picture and all the light on the other.

As I am writing, a young friend who has just commenced his study of art by reading "Howard's Sketchers' Manual," tells me the removal of the stones to the other side would produce the "wedge" form of composition, which, he is told, is much used by landscape painters. This is quite true, and agrees with all I have yet said, because all angular composition must, more or less, partake of the form of the wedge, which is the basis of many of the finest compositions. Let the student bear in mind, however, as an axiom, in arranging his masses in this form, that *the point of the wedge must be supported*. Without such support the picture will convey the uncomfortable impression that some of the principal masses will slip down. And I would here guard my readers against the error of my young friend, that of jumping to the hasty and imperfect conclusions which a superficial familiarity with the technical names by which various forms of composition are designated, without an understanding of the principles upon which all pictorial effect must be based. I would strongly recommend the student of these lessons to blend his reading with practice, endeavouring to produce photographs in which art rules are embodied and illustrated. Above all things, avoid the glib parrot-like parade of art terminology, which, without art practice, is such a contemptible thing to all earnest men.

One of the most precious qualities of the photograph that has suggested these remarks is its perfect *expression*. It is not that of repose so much as of perfect serenity. It suggests to the mind one of those lovely days of which not a dozen occur in a twelvemonth, when the sun shines with a *white* light, and the breeze is hushed so still that you can hear the bee hum and the trout leap in the lake,—one of those days when, to the photographer, fortune helps art, but also one of those days on which, with such a photographer as Mr. Mudd, art helps fortune, and is not content with mere unselected looking-glass truth.

I have spoken of the expression of this picture. Some may doubt that such a thing was possible in landscape photography; but it is so, to a very great degree. Some scenes demand that they should be rendered in a sparkling and lively manner; others, such as portraits of places, with all the dry matter-of-fact of mechanical art; others, again, are better expressed under the gloom of approaching twilight. I have before me two photographs: the one so absolutely expresses the effect of early morning that you

feel the chill, bracing air as you look at it. It is difficult to explain how this is obtained. The scene represents the outskirts of a distant town round which runs a river. The distance is composed of hills. The sun shining on the slate roofs of the distant houses causes so many glittering spots of light, which, however, are well grouped together. The river also shimmers in the sunlight, forming a broad curved line of light stretching across and into the picture; the foreground is composed of a steep bank. The photograph in this state would look scattered and without unity; but on the bank is placed the figure of a girl with a basket gathering ferns. The figure is by far the blackest spot in the picture, but possesses touches of the highest lights caused by the strong sunlight, which gathers together and repeats the lights in the distance and on the river. This figure has the effect of reducing the whole into harmony. The conclusion is, that the glittering lights, like sparkling dew, give the effect of early morning, but which, if not corrected, would have a scattered and disagreeable effect, but which is quite compensated for by the figure which brings them into a focus.

The other picture is a view of the pool at Burnham Beeches, in which the effect of the commencement of twilight is perfectly given. The sun is sinking behind a screen of trees, defining the branches and trunks with a thin edge of light. The darkest mass of shadow is in the centre of the picture, relieved by some white ducks on the bank of the pool, and which serve to enliven the only part of the picture that was in danger of dullness. No figure is introduced, and the whole expression is that of solitude and gloom.

In looking over my portfolio I met with another photograph which will illustrate what I have advanced. In this picture, which is by Mr. Durrant, a breezy day is perfectly expressed. It has not that appearance of petrified motion which is sometimes the defect of instantaneous photographs of the sea, but you feel that the wind is stirring the trees, although it is evident that nothing moved while the picture was being taken, and the exposure must have been considerable. The clouds, which are from a separate negative, appear to skim through the sky with a very lively motion. These examples will, I hope, tend to show that photography, even in landscape, need not be the lifeless thing we find it in average productions.

M. BRAUN'S COLLODION.

Most photographers are familiar with the charming stereographs of Alpine scenery issued by Mr. Braun, a class of picture in which he has had no rival but Mr. England. Dr. Vogel, in his recent letter to our excellent Philadelphia contemporary, gives the following as the formula of the collodion used, which, our readers will observe, is very similar to that of the collodion generally used by Mr. England. Braun's formula stands as follows:—

1. Iodizer.

Ether	...	...	...	250 grammes
Alcohol	...	...	...	200 "
Iodide of cadmium	...	...	14	"
Bromide of cadmium	...	...	9	"

2. Plain Collodion.

Alcohol	...	...	...	250 grammes
Ether	...	...	...	250 "
Cotton	...	...	...	15 "

1 and 2 are mixed in the given proportions. If the collodion appears too thick, it is diluted with equal parts of alcohol and ether.

Silver Bath.

Nitrate of silver	...	...	8 to 10 grammes
Water	...	...	100 "

Developer.

Water	...	...	1000 grammes
Protosulphate of iron	...	...	40 "
Acetic acid...	...	...	60 to 80 "

ACETATE OF LEAD IN THE PRINTING BATH.

At a recent meeting of the Philadelphia Photographic Society, Mr. Newton exhibited some prints which excited much admiration. The process by which they were produced was as follows:—

He floated the paper for half a minute on—

Nitrate of silver	...	...	25 grains
Magnesium	...	...	25 "
Potassium	...	...	25 "
Acetate of lead	...	...	5 "
Water	...	...	1 fl. ounce.

Toned in a bath made as follows:—

Carbonate of lime...	...	1 grain
" magnesium...	...	1 "
" baryta	...	1 "
Water	...	1 fl. ounce.

To which gold was added in quantity sufficient to produce the desired effect.

A GOOD KEEPING COLLODION.

BY W. J. LAND.*

HAVING made a series of experiments with a view of ascertaining the best-keeping and most generally useful bromodized collodion, I find the following formula to yield an article which combines, in a high degree, five excellent properties that a negative collodion should possess, viz: great stability and sensitiveness, fine flowing qualities, full intensity, and capability of producing extremely delicate details. This collodion works well when ten days old, and excellently for two years afterward. Samples of the collodion, now twenty-two months old, produce faultless negatives as regards the above-named qualities. It is yet almost colourless, and its sensitiveness scarcely impaired. In working qualities it is very similar to Dr. Vogel's excellent standard collodion, but possessed of greater keeping qualities, which I attribute principally to the bromide of magnesium. It would please me much to have others experiment, and report upon the good qualities claimed for this collodion, which, I believe, is without a superior.

Formula.

Plain collodion containing	3-5ths
(by volume) of pure alcohol	... 1 ounce
Pure bromide of magnesium	... 3 grains
Pure iodide of cadmium	... 4½ "

The plain collodion used in the experiments was four months old.

ENLARGING BY MAGNESIUM.

BY J. SOLOMON.†

BEFORE giving you a practical illustration of the method of producing enlarged photographs by means of the combustion of magnesium, a few words on that singular metal may not be out of place.

Magnesium was first discovered by Sir Humphrey Davy, in 1807. He reduced magnesium under the most powerful electric apparatus that had been made in his days. Some years after Mr. Deville obtained the metal by acting on the chlorides of magnesium and ammonium with sodium, but only a few grains were obtained after a troublesome and costly operation.

Bunsen reduced magnesium by decomposing the fused chloride of magnesium by means of the electric battery, and the metal so obtained was pressed into wire. In 1859 Professor Roscoe, of Manchester, instituted some experiments to show the intense nature of the light emitted from combustion of the magnesium, and these experiments were published in 1861.

Sonstadt, of Nottingham, was induced to go into a series of experiments, as it appeared manifest that, if magnesium could be obtained on a large scale and at a reasonable price, it would be a great boon to the art of photography. In the year 1863 Sanstadt patented his process, which is as follows:—

The magnesia of commerce—that is, carbonate of magnesia—is acted on by hydrochloric acid, and chloride of magnesia is formed. To this chloride the chloride of potassium is added, and these are fused together. These in turn are placed in crucibles with sodium, and the magnesium is obtained in small globules, almost as minute as dust. This residue is well washed and placed in a large iron refiner, which is placed in an intensely hot furnace, where it remains from fourteen to eighteen hours, when the metal volatilizes and passes down a tube running through the centre of the refiner, and the metal is found at the bottom in a large lump. It is not yet suited for making wire, because of the impurities it contains; it is therefore broken into small pieces and again refined. Sometimes this refining has to be repeated three times or more, and each time it loses in refining twenty-five per cent. of the metal introduced. The pure metal is cast into ingots, then drawn into wire, and again pressed between hot rollers to make it into ribbon.

Magnesium is the lightest known of all metals, being one-sixth of the weight of silver. It is a very good conductor of heat, and the most energetic generator of electricity known; hence it is now much used instead of zinc for galvanic belts.

Magnesium is mostly known for its lighting properties, and its use and aid to the art of photography is now a fact established. It is used by the army in Abyssinia, and can be attached to balloons, which would prevent any ambush surprise, and can be used as rocket signals, or for lighting up at night the entrance of vessels into a harbour; or for throwing, by the aid of reflectors, its light into the deep sea at night, so that divers can examine the keel or sides of a ship, on an accident happening at night to the lower parts of the vessel. The light is also used in examining the rifled and other cannon, as any trifling crack or flaw is easily distinguished by its means. It is the easiest light for copying oil paintings, giving every shade of colour, producing all the minute shades of half-tone; and an artist is now exploring and taking photographs of everything interesting in the catacombs of Rome.

Having said so much concerning magnesium, allow me to say a few words concerning the magic lantern.

It contains in itself all requisites for producing perfect enlargements of the slides which are inserted, and which for the purpose in hand are in the form of thin sharp negatives. With a good light (such as that of magnesium), a good condenser, and an achromatic object glass (or, more properly, an achromatic portrait combination) what is there to hinder the enlarged image thrown upon the screen from being both sharp and true to all the gradations in the negative? The principle of enlarging is to throw an image upon a screen, which screen shall be composed of sensitive paper, on which, by after-developing or otherwise the image shall be strongly and visibly impressed. For great brilliancy, albuminized paper prepared with iodides and bromides may be employed; or for great softness of design, either rice surface paper or plain paper, such as Hollingsworth, thick Saxe or Rive, can be used. The exciting solution is nitrate of silver, with a few drops of acetic acid added.

The image having been allowed to act on this sensitive paper for a portion of time varying from twenty seconds upon and according to the degree of enlargement required, is afterwards developed by a solution of gallic or pyrogallie acid; and, when the development is considered sufficient, it is fixed by means of hyposulphite of soda. These remarks are only of a general nature. I now proceed to supplement them by actual experiment.

* Philadelphia Photographer.

† Read before the North London Photographic Association, March 4th, 1868.

REMOVING VARNISH FROM A COLLODION FILM WITHOUT INJURY.

BY V. G. BLOEDE, CHEMIST.*

It is often a great desideratum to remove a film of varnish from a negative or positive picture. Not only are many pictures, especially ferrotypes, spoiled by unskilful or careless varnishing, which produces "ridging" on the plate, but the glossy surface of the varnished picture, acting as a powerful reflector, renders the clear and perfect copying of the same impossible. An unvarnished ferrotype can be copied almost, if not quite equal to the original; while one that is protected with a film of any kind of varnish never copies clearly, but always more or less blurred and fogged. Even to the print, a badly varnished, "ridged" negative is, in some cases, highly detrimental. Though, in many cases, very desirable, no process has been hitherto known, as far as we are aware, which would thoroughly remove all adhering varnish, without the total destruction of the collodion film; and in placing before the practical photographer a sure and simple method accomplishing this result, we feel confident that it will prove of much value to him.

Our method of removing the varnish from a picture, and which leaves the delicate film of the collodion cleaner and better than ever, is by means of the vapour of alcohol. Place a small dish or saucer containing about two ounces of alcohol upon a moderately hot stove, and when it begins to boil, hold your picture in a slanting direction, in such a manner that the alcoholic vapour strikes directly upon the film of varnish. Here it is rapidly condensed, and, absorbing the gums, runs off the plate in large drops. In a very few seconds the plate will be perfectly clean, and every atom of the varnish have disappeared, leaving the collodion film in its original delicate condition. The alcohol, in the form of vapour, seems to have a peculiarly powerful action upon the varnish gums, and in this form one ounce is more efficient in removing the gums than when the plate is washed in one pint of warm alcohol. If a large quantity of plates are simultaneously treated, the drippings may be collected, and will generally be found to be of the same consistency as the original varnish used upon the plate. A very convenient way of working this process is with a fuming-box such as is used for fuming or ammoniating silvered paper. A dish of well-heated sand may be placed upon the bottom of the box upon which the alcohol is placed, then, after fastening the plate to the cover of the box in the usual manner, this may be closed. In the course of a few moments the varnish will be found to be entirely removed. Though the sphere of this process is rather limited, it will, nevertheless, undoubtedly find many useful applications.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The annual meeting of this Society was held in Myddelton Hall on the evening of Wednesday, March 4th, Mr. W. W. KING in the chair.

The minutes of a former meeting having been read and confirmed, the SECRETARY read the following

ANNUAL REPORT.

YOUR COMMITTEE, on presenting their report for the past year, congratulate the Society on its continued prosperity. Though they cannot but regret that the number of papers has not been so large as could have been desired, yet the following list will show that the session has not been quite devoid of interest in that respect:—

On the producing of diffusion of focus in photographic images, and the effects produced by the use of very small apertures or stops, as required when including a large angle of view—By Thomas Grubb, M.R.I.A.

* Philadelphia Photographer.

Remarks on landscape photography, and the apparatus employed—By E. Dunmore.

What branches of photography will be found most amusing and interesting to the amateur—By J. Bockett.

Architectural photography—By W. W. King.

Artistic pictures photographically considered—By E. Dunmore.

Glass for photographic purposes, and the changes of colour to which it is subject—By G. Wharton Simpson, M.A.

They would also call attention to the apparatus which various manufactories have kindly exhibited, and especially to the photographs which have been brought before your notice, amongst which, as deserving particular notice, must be mentioned the large photographs of Krupp's steel manufactory, in Prussia, and some exquisite transparencies by Mr. W. Bedford, one subject of which was your presentation picture for last year. It is much to be desired that this branch of photography should be more generally followed up. The surplus, as will be seen by the account submitted by our Treasurer, Mr. Hill, is good, and will enable your Committee to distribute a larger number of prints than they have done in any former year; but they will, as heretofore, however, confine the distribution to that of prints possessing more than average merit, and may point with some degree of satisfaction to what they have done already, *inter alia*, in securing such a beautiful specimen as that of Holy Street Mill, by our member, Mr. Francis Bedford.

In conclusion, your Committee would again urge on the members the importance of the contribution of papers for the meetings, and the exhibition of pictures and apparatus at the same, which always possess an interest for those who are really earnest in photographic pursuits.

The Treasurer's account is as follows:—

Treasurer in account with the North London Photographic Association.

Dr.	£	s.	d.	Cr.	£	s.	d.
Balance	38	15	1	Expenses from last year...	8	18	0
Subscriptions	37	16	0	Prints, journals, rent, and			
Arrears	1	11	6	sundries	29	6	9
	£76	2	7	Balance	39	17	10
Balance	39	17	10		£75	2	7

Examined,
JAMES COOPER }
J. WERGE } Auditors.

4th March, 1868.

D. W. HILL.

The officers for the ensuing year were then elected as follows:—

President: Charles Woodward, F.R.S., J.P.

Vice-Presidents: G. Wharton Simpson, M.A.; W. W. King; A. Goslett.

Treasurer: D. W. Hill.

Honorary Secretary: John Barnett.

Committee: J. Bockett, W. Bedford, C. J. Belton, W. Cooper, E. Dunmore, F. W. Hart, T. Ross, and W. Shave.

It was proposed and carried, after some conversation, that the January meeting, which, coming so early in the month and close upon the time of Christmas festivities, was often inconvenient, should in future be postponed at the discretion of the Committee, who should announce the arrangements made at the December meeting.

Mr. SOLOMON then read a paper on the magnesium light (see page 127) and, with the aid of Mr. Allen, proceeded to demonstrate its value for enlargements, using the apparatus he has devised for the purpose. The exposure given was sixteen seconds, and the enlargement, although good in other respects, was considerably over-exposed.

Some conversation followed, in which Mr. Allen stated that ten seconds' exposure would have been sufficient. The paper was prepared in accordance with the formula we recently described, and developed with a hot solution of gallic acid. Where rapid exposures were for any reason desirable, hot development was an advantage; but for certainty and brilliancy he preferred cold development.

Mr. WERGE exhibited a couple of photographs on albuminized paper, which had been printed about twelve years, and were as pure and fresh in colour as they were on the day they were produced. He attributed their permanency to the method of alternate cold and hot washing which he had recently described at a South London meeting. The subject of one of

the pictures was a charmingly artistic illustration of the "Song of the Shirt," and of the other, "The Sewing Machine."

Mr. DUNMORE exhibited some brilliant prints produced with a concentrated light.

Mr. GOSLETT exhibited several examples of glass which changed in colour from exposure to light.

A conversation on the subject followed, in which Mr. Goslett stated that the common green sheet glass was the least liable to change, and therefore most suitable for glass houses. A 21-ounce glass was of suitable substance.

After some further conversation and several votes of thanks, the proceedings terminated.

LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, the 9th inst., the Rev. J. B. READE in the chair.

The minutes of a preceding meeting having been read and confirmed, the Hon. Wm. Petre was elected a member of the Society.

THE CHAIRMAN then read an eloquent extract from a speech intended to have been delivered by the late Sir David Brewster before the Royal Society of Scotland, but, in consequence of the illness which resulted in his death, read for him. It pointed out in forcible terms the value of photography as an adjunct to scientific education, a subject which he (the Chairman) was glad to say occupied much more attention now than it did when he was a boy, for his schoolmaster would at any time have rather have seen him construing a line in Horace on the beauties of the fields, than have seen him gathering or studying the beautiful flowers so described. We shall print Sir David Brewster's remarks in our next.

Dr. MANN then read an interesting account of the difficulties of an amateur in South Africa, and exhibited many interesting landscapes and portraits illustrative of ethnological types. His paper will appear in our next.

Mr. FRANK GOODE said that as he had some experience in photography in the four quarters of the globe, he might offer one or two remarks on the subject of the paper. He was himself a great stickler for the wet process, and did not believe, as a rule, in any necessity for the use of dry plates. He had spent about seven months photographing in the East, and had used it entirely. One of the greatest difficulties which arose consisted in the difficulty of transport of materials, and also of the great heat affecting the chemicals if they were not suitably packed. He had had his packing-cases lined with felt $2\frac{1}{2}$ inches thick. This was, of course, a somewhat expensive process, but the result was worth the cost, as it kept everything quite cool. His collodion bottles were packed in tin cases surrounded with sawdust. He was from home nine months, and the quality of the collodion steadily improved from the time he commenced using it—two months after he started—to the end of the time. He liked the developer old also, and would, in future, always take care to keep a gallon of developing solution prepared in advance. He had very little time allowed by the dragoman of their party, often having not more than two hours to produce six or eight negatives and unpack and repack all his wet apparatus. Nevertheless, he would use the wet process again. Dry plates would, of course, be occasionally useful for an emergency, where time could not be allowed for getting ready wet apparatus, when the steamer only touched for a short time at any place, but he would rely on the wet for all general purposes.

Mr. S. FRY was glad that Dr. Mann had recognized the importance of getting negatives without after-intensifying, and the advantages which the gelatino-iron developer afforded for such a purpose. In reference to the morphia process his faith had been a little shaken, some plates prepared a few months which he had recently tried having lost sensitiveness almost entirely.

Dr. MANN said, referring to the remarks of Mr. Goode, that no doubt a skilled professional photographer would get good results by almost any process and under any circumstances. It should not be forgotten, however, that photography was more difficult in South Africa than in the desert, as the moisture, as well as the heat, was so troublesome in Africa. His appeal to the members of the Photographic Society was for a process which an amateur might work with some degree of success under the difficult conditions he had described. He should especially have liked to know of any one who had any

experience with the plan of exposing the plate whilst still in the bath.

THE CHAIRMAN, after preposing, in complimentary terms, a vote of thanks to Dr. Mann, announced that Mr. H. P. Robinson had volunteered to produce one of his well-known charming pictures, and present a copy to each member of the Society as a presentation print. Mr. H. Claudet had also volunteered to present each member with a print from the last negative of his late father, which had an especial interest from having been taken with his topaz lens. Mr. England had also promised, when on his summer tour, to produce a special negative for the purpose of presenting copies to the members. These things would prove, in spite of the breezy little notices which appeared now and then announcing that the Society was going down, that its motto was "excelsior," and of this the public, as well as themselves, would become assured.

THE CHAIRMAN called attention to a little work exhibited by Dr. Powell, in which an account of the ascent of the Pieterboth Mountain, in the Mauritius, 2,814 feet high, was illustrated by photographs. He also called attention to some fine specimens of portraiture by Mr. Fradelle. That gentleman, on being appealed to, explained that, having an opportunity of spending a few hours in the studio of M. Salomon, these pictures were the result of an effort to produce results in a similar direction. Mr. Fry exhibited some very fine portraits of a similar class.

THE CHAIRMAN said that the Secretary had received a further communication from Mr. Johnson on the use of permanganate for rectifying the nitrate bath; but as the hour was late and Mr. Johnson was unable to be present, he would defer its reading until another occasion. At the next meeting, also, Mr. Griggs would read a paper on the application of photography to press printing, illustrating the process by demonstration before the members.

After some votes of thanks, the proceedings terminated.

Correspondence.

THE COFFEE PROCESS.—RECTIFYING BATHS.

MY DEAR SIR,—I observe, among your Answers to Correspondents, that you hope for some information from me on the subject of the Coffee Process. I confess I have not much more to give than I gave some months ago, the only source of deterioration in negatives lying in the age and failing qualities of the nitrate bath. I have found that by proceeding as I shall presently describe, this fickle fluid may be brought to a state of perfection for the production of negatives, and rendered equal to a new bath, if not superior.

I generally use 16 ounces of bath at a time for 11 by 9 plates, and when this becomes slow and gives hard negatives, I set it aside. After working up some 60 or 80 ounces of solution, I put the whole into a very large porcelain capsule, which I place upon an iron frying-pan filled with sand over the hot plate in the kitchen, and cover the capsule with an inverted glass funnel. I then evaporate rapidly to perfect dryness, and the liquid, which at first was clear and bright, becomes black and discoloured from the precipitation of the organic matter. The salt now froths up violently, filling the whole capsule; nitrous fumes are disengaged; the froth sinks to the bottom; and the nitrate of silver enters into a state of fusion. I keep it thus quietly fused for seven or eight minutes, after which I remove sand-bath and all from the fire, and let it slowly cool. It this is done carefully, the capsule will not crack; but if too much nitrate is left, the salt, in becoming solid, contracts, and adheres so strongly to the porcelain that a fracture will result. When quite cold, I add distilled water, which in a few hours dissolves the salt, and, after filtering, I measure the density of the resulting solution by the argentometer, and add sufficient water to dilute it to 35 grains to the ounce. Then, to every 16 ounces I add one drop of pure nitric acid, which I find quite sufficient to keep the shadows of the negative clear.

If any of your readers will only try this plan—which, after all, involves but little more trouble than the usual system of doctoring a bath—they will find that, with ordinary commercial collodion and an iron developer of 15 grains with 15 minims of acetic acid, first-rate negatives are produced, requiring no after-intensification whatever. As the conditions in this case are unvarying, the result being the production of an absolutely pure solution of nitrate containing a trace of pure

iodide of silver, there seems no reason to suppose that the same very desirable consequences will not always follow from its use. I need not add that the production of satisfactory coffee plates or collodio-albumen plates by Mr. England's method will necessarily follow from the employment of this excellent bath.

Forgive me for the space I have occupied, but the matter is, I think, of sufficient importance to warrant some notice being taken of it.—Faithfully yours,

N. JOCELYN.

Florence, March 2, 1863.

PHOTOGRAPHY AND DISEASE.

DEAR SIR,—Your article on "Photography and Disease," and the correspondence thereon, I hope will have the effect of making many photographers take a little more care to guard themselves against the inhalation of noxious fumes and absorption of poisonous solutions. A great many operators and printers are so fearfully careless in the use of the various photographic chemicals that the wonder is we do not hear more of their ill effects. I cannot understand, for instance, why so many will persist in the use of cyanide of potassium. Then, again, citric acid may be in many cases substituted for the volatile acetic acid; the inhalation of the vapour of this acid, I am firmly convinced, is most injurious, used, as it frequently is, day after day in small and ill-ventilated dark rooms. I think, with Mr. Fitt, that the contact of the skin with the solution of nitrate of silver, in print washing, is not so very injurious; but in my opinion the hands should be dipped as little as possible into the gold toning baths. It would be well if all employers would provide their printers with india-rubber gloves* for use in the operations of toning and fixing. In my time I have toned a considerable quantity of prints, and I have had two or three very painful sores upon the hands. On one occasion I suffered intense pain for a fortnight, and scarcely slept during that time. My general health being remarkably good, I cannot but think that the gold bath was the cause of my sufferings. I should like to know if others have found themselves similarly affected. Perhaps Mr. Bovey could tell us something of the matter.

Your correspondent, M. W. J. S.,† writes of the injurious effects of collodion used for plate cleaning. Why use it? There are other plans to effect this purpose as well.

I consider it as a duty all operators owe themselves to take a brisk walk after work, and so exhale as much as they can of the ether they may have inhaled during the day.

Hoping that this subject may be thoroughly discussed in your pages, I am, dear sir, yours very truly,

Stonehouse, March 9th, 1868.

A PREVENTIVE MAN.

PHOTOGRAPHY AND DISEASE.

DEAR SIR,—In your chemical analysis of the compounds used in photography you have always been most willing to lay particulars before the public, and oblige your numerous friends and readers. Would you enlighten my ignorant self the difference in physical strength between an operator and his employer.

I see in your last a correspondent evidently finds out a plan to save his own health by allowing "an assistant" to do the "injurious" part of the work. Does he think employers and employed are made of a different kind of clay? If not, surely his discovery will fail in bestowing much benefit upon his unfortunate fellow-beings who, unlike him, are compelled to work.—I am, dear sir, yours, &c.,

SUFFERER.

March 10th, 1868.

[The question opened by implication in our correspondent's letter is a wide one. He implies that an employer is not justified in paying others to do for him things which would be inconvenient or even injurious to himself. A wide question of social philosophy is involved which we have not space to discuss here; but we may point out that, admitting the principle implied, our correspondent would not be at liberty to employ colliers to hew coals or sailors to reef topsails on a stormy night, or persons to engage in a thousand uncomfortable

or dangerous occupations which conduce to public comfort. To narrow the question to the case of photographic operators, we always urge on employers the importance of securing to their operators the fairest conditions possible for doing their work, such as the use of well-ventilated dark rooms, the disuse of unnecessarily injurious chemicals, &c.; but surely no one would argue for a moment that an employer in delicate health was acting unfairly or selfishly in engaging an assistant to do a certain class of duties for which he personally felt himself unfitted by reason of his delicacy. The portraitist fully engaged in the studio, whether he be employer or employed, has frequently quite sufficient strain upon his nervous system in the duty of managing difficult sitters, without further depressing his energies by the atmosphere of the dark room; whilst the who is fully engaged in the dark room would scarcely be in the best condition for bearing with the whims of sitters, and making artistic pictures of awkward persons.—Ed.]

PHOTOGRAPHY AND DISEASE.

DEAR SIR,—I have read with much interest the various letters on "Photography and Disease." It is a very important subject to every photographer, and every person who has anything to say, for or against, should not hesitate to say it, so that our beautiful art may not be condemned unless clearly proved guilty.

The majority of your correspondents seem to hold the opinion that photography is, however practised, unhealthy. That was my own opinion for a long time; but as it was from the first contradicted in my own experience, I have no hesitation in saying that no person has given the matter more careful attention than I have done during the past six years, and I now say without hesitation that I do not believe that photography is in itself more unhealthy than numbers of other professions and businesses that we hear no complaints about. It affords greater facilities for abuse, and is so fascinating that it lures its lovers to over-exertion, and then it receives all the blame.

When I commenced the practice of photography, about six years ago, I had been troubled with a cough for eight or nine years, and knowing that it was considered to be unhealthy, I was naturally anxious in the matter. Being very fond of the art, and determined to learn it thoroughly, you may be sure I did not spare myself; and it rather surprised me when I found that my health was improving. I then concluded that although in general unhealthy, photography was not so to me, and that some of the chemicals did me good. That opinion was confirmed by a medical friend, who, knowing that photography was considered to be unhealthy, felt at a loss to account for my slow but steady improvement in health in any other way than by attributing it to the fumes of cyanide and ether; but he cautioned me as to their dangerous nature. At the time I wrote the particulars to you, and you were so kind as to publish them. That was more than two years ago, and my health still continues better; but I have carefully watched the effects, and now believe that neither cyanide nor ether, nor any other chemicals, affect me, either injuriously or beneficially. The great temptation to over-exertion in summer, and irregularity in taking food, are, I believe, greater enemies to photographers than their chemicals.

As I have done nearly all the work in my business during these six years except print and mount, I have had to do with all the chemicals commonly used; and as I have frequently wrought from six or seven o'clock in the morning sensitizing, printing, and toning, till nine or ten o'clock at night, I had plenty of them.

I know a gentleman who commenced photography believing, with many others, that it was very simple, and that he could make lots of money at it. He did not trouble himself to learn "the reason why" of anything, and knew little about his chemicals. He got tolerably fair negatives, and took a good deal of money; but he lost more than he gained. He mixed his cyanide by guess, and, judging by the manner in which it cleared the negative, I should imagine it could not be weaker than 10 or 12 per cent. of cyanide, and frequently the bottle was left uncorked. He was very careful to have clean hands, and he kept in the kitchen a solution of cyanide for washing them which could not contain less than 12 or 15 per cent. of cyanide. The parlour was above the kitchen, and I have heard his sister say that when sitting in the parlour she could easily smell the cyanide when her brother was washing

* The employment of horn forceps is best. They are simple, convenient, and clean.—Ed.

† The signature to the letter in our last, "M. W. J. S.," should have been "M. W., Junr." The initials belong to a well-known and highly esteemed amateur of considerable experience.—Ed.

his hands in the kitchen. I could give other instances, but that one is enough of the action of chemicals. And is it, then, any wonder that people suffer?

If photography is so unhealthy, there can be no difficulty in proving it if people come forward; and if not, let all true lovers of the art bestir themselves, and wipe away the stain, and prove that photography is not unhealthy to men of intelligence who know how to use without abusing it.—I am, dear sir, yours very truly,

D. WELCH.

Nevery, March 9th, 1868.

MR. HENDERSON'S ENAMEL PROCESS.

SIR,—In your last week's impression of the PHOTOGRAPHIC NEWS you did me the honour of noticing some enamels exhibited by me to a few of the members of the South London Photographic Society. Allow me to make a few remarks concerning the same. My process is in every respect different to any other (as far as I am aware), except that preparations of the same metals are used. By my process I am able to get a great variety of tones, from a blue to red or black. My only difficulty at present lies in my inability to get a suitable material (sufficiently hard) to fire them on. I am experimenting in manufacturing enamel, and hope shortly to overcome this difficulty. Simultaneously with working out my process, I have hit on several useful (if not valuable) discoveries: viz., a permanent printing process on paper without silver, or any white or black surface; a new intensifier; and a more suitable picture for the magic lantern. A transparency (without silver, I say again) can be burned in on glass, and curved, so that when the image is reflected on the screen there will be less (if any) marginal distortion; any density and colour may be obtained.

I am sorry I cannot give the photographic world the benefit of my experiments, for reasons explained before to you. Apologising for troubling you, I remain, sir, yours respectfully,

A. L. HENDERSON.

PS.—I forgot to say that my process is particularly applicable for porcelain, or any glazed surface.

49, King William Street, E.C., March 10, 1868.

[The importance of the incidental discoveries which Mr. Henderson mentions, as well as of his enamel process, will, we are sure, occasion regret to Mr. Henderson himself, as well as to ourselves and to the photographic world, that he cannot with propriety make public the result of his labours. But when a gentleman has devoted much time, thought, and money to the perfecting of any discovery or invention, it is perfectly clear that he is entitled to the advantages of such discovery. We regret to say that the temper in which many discoveries and inventions, when published freely, have been received by portions of the photographic world has not been of a character to induce experimentalists to be content with the scanty and oft-disputed honours of discovery.—ED.]

TO TOUCH, OR NOT TO TOUCH.

SIR,—When I read, in the letter on the 106th page of your valuable journal of 28th February last, regarding M. Salomon's portraits—I need not quote the remarks, as I believe there are very few photographers who have not these pages to refer to—I was reminded of some recent experience of my own.

I am a travelling photographer, and having often heard of the great excellence of the photographs of a Mr. Collins, Clonmel, who has acquired at least a provincial celebrity, I, for curiosity, recently visited that town to see the pictures. They far exceeded my expectations, but, to be candid, it appears to me some of them are "touched" and some are not. I must confess, however, I have seen nothing to come up to the general detail and engraving-like softness of these pictures.

But whether these or M. Salomon's portraits, or any others which excel, are touched or not, I feel that professional photographers are sadly in error in condemning a photograph for being "touched" to advantage, as it is a rare occurrence to find one which is not. Many very excellent pictures, as we all know, if left in their original state would be quite objectionable, through spots or lines of a detrimental nature, which will occur with the most cautious and expert manipulator; and if "touching" (as it is called) be a crime, few of us are guiltless. For my own part I am quite incompetent to "touch" in any further degree than is necessary to remove marks or spots; but because

I lack artistic talent, I should consider it very dishonest to condemn what I cannot accomplish. We know that the very best photograph, unaided by the artist's pencil, is often deficient as a work of art. Perhaps, however, it may be foolish to encourage "touching," as its success may prove ruinous in incompetent hands. I know that I have altered the likeness in almost all cases where my ambition tempted me to its practice beyond certain limits, and I fear that we must come to the final conclusion that no photographer can attain the highest excellence in portraiture if he have not something of the skill of a miniature painter.

BONA FIDE.

Talk in the Studio.

PHOTO-RELIEF PRINTING.—Mr. Woodbury's process of photo-relief printing has now come into actual commercial operation, and Disderi and Co. are publishing somewhat extensively cabinet portraits of various members of the royal family produced by this means. M. Disderi was summoned a few days ago, by the Prince of Wales, who was desirous of receiving an explanation of the principles and practice of this method of printing.

PHOSPHORESCENT SALTS.—At the meeting of the Chemical Society on Thursday evening, 5th instant, the President exhibited some interesting examples of phosphorescent salts arranged in series so as to imitate the colours in the solar spectrum. A butterfly, also, with gorgeous wings extended, was constructed by placing the various salts, in patches, behind the glass plate of a pressure-frame. These illustrations were the work of M. Gaiffe, and were said to have been prepared from the sulphates of baryta, lime, and other earths, by reduction with carbon to the state of sulphides. They are very similar in character to the series of phosphorescent salts arranged by Prof. Becquerel for the *Conservatoire des Arts et Metiers*, in Paris. To start the phosphorescent activity of the chemical salts the frames were exposed to the intense light given out during the combustion of about six inches of magnesium ribbon.

MORE PIRACY.—Mr. Isidor Gerson, a printseller, of 71, London Wall, was summoned before Sir Robert W. Carden by Mr. Henry Graves, of Pall Mall, the eminent publisher to the Queen, for selling fourteen photographs of engravings of which Mr. Graves possesses the copyright. After some evidence, Mr. Beard took an objection to four of the summonses which referred to the copyrights which charged the defendant with copying "a painting or the design thereof," and urged that there was no evidence to show that these were copies of a painting.—Sir Robert W. Carden reminded Mr. Beard that the words were "or the design thereof."—Mr. Beard contended they were the same thing. With regard to the other summonses, they were for fraudulently selling photographs with the name of a person on them as the maker who was not the maker. There had been no evidence of fraud, and without that there could be no conviction. If, however, the worthy magistrate decided on convicting defendant, he hoped Sir Robert W. Carden would grant him a case.—Sir Robert W. Carden said that it was impossible to believe that there was not a guilty knowledge on the part of the defendant. He would not fine him the full penalty of £10 in each case, but in the mitigated penalty of £5, or one week's imprisonment in each case, making £70 or fourteen weeks' imprisonment. In France it would be imprisonment without a fine; he trusted he should see the time when that would be the law in England.—The fines were then paid under protest.

PENSION TO LADY BREWSTER.—A pension of £200 per annum has been conferred on Lady Brewster by the Government, in consideration of the scientific labours of her husband.

PATENT LAW REFORM.—At a recent meeting of the Inventors' Institute, on Thursday last, Mr. R. Marsden Latham read a paper "On the Desirability of Assimilating our Patent Laws to those of France and America, to enable this Country to Maintain its hitherto almost Uncontested Superiority in the Mechanical and Chemical Arts." After some discussion, the further consideration of the subject was postponed until the next meeting.

VIGNETTING IN THE CAMERA.—Various methods have been employed for the purpose of vignetting the negative so as to

secure uniformity and save trouble in printing. Mr. Rejlander mentioned to us, a few days ago, a plan which he had been using with success. A piece of card, with a suitable aperture, is placed in the camera, an inch or two in front of the sensitive plate, which was then duly exposed to the object to be taken, the image, of course, being vignettied by the card in the camera. The edge of the plate would, however, be transparent, and if used so would yield a vignette graduating into black instead of into white. The next operation is therefore to place in the camera, in place of the card, a piece of glass or mica, with the centre blackened and rendered opaque to protect the image already received on the sensitive plate. The margin, being then exposed to light, becomes, on development, dense and opaque, and produces a satisfactorily vignettied negative.

To Correspondents.

DELTA.—For new plates we generally prefer the use of a cream or paste of alcohol and rotten-stone. Water and rotten-stone, or water and whiting, will, however, answer. For plates which have been used, dilute nitric acid is good, or a cream-like solution of whiting and water, with about half a drachm of cyanide of potassium added to each ounce. 2. Permanganate of silver will render almost any sample of water sufficiently pure for all photographic purposes. It is not an article kept in commerce. No doubt such a firm as Messrs. Hopkin and Williams will prepare it for you. 3. Red blotting-paper pressed in contact with the back of the plate will, we believe, serve. Mr. Gordon uses burnt sienna, we believe. This is kept in a moist state, and applied with a broad brush.

VENATOR.—You had better have glass on both sides of such a studio as that you describe. The amount of glass you describe will probably serve. 2. The lens you propose to use is scarcely sufficiently long enough in focus for cabinet portraits; but used with a small stop it will serve. It is the only lens we know which is so well suited for producing both cards and cabinets. A studio of 27 feet long will answer. 3. We shall be glad to see the plate-box. 4. We shall have pleasure in showing you the Salomon portraits if you call at our residence. Wednesday you will certainly find us at home.

W. J. A. G.—Of course the tent will be kept accessible to fresh air when not in use; but we should also prefer, with a perfectly waterproof covering, to have a means of admitting air whilst operating. Five or ten minutes, a period sometimes necessary, in a small tent in hot weather, with the fumes of chemicals, render ventilation desirable. As to the mode of admitting air without admitting light, you have only to remember that air will turn round any number of corners, and that light will not, to devise a satisfactory means of ventilation. An aperture underneath the table part of your tent will serve; or an aperture anywhere, covered with a loose apron. In some tents a ventilator is placed underneath the small tank which stands on the top of the tent. 2. Although, with some forms of bellows camera, you can get some of the advantages of the swing-back, you cannot get all, nor can you get them so perfectly or so conveniently. You could not, by keeping the front portion of the camera level, and tilting the part containing the plate, obtain the advantages of the swing-back. The principle to be remembered in getting correct images of buildings, &c., and avoiding converging uprights, &c., is that the plane of delineation (that is, the sensitive plate) must be parallel to the building to be delineated. 3. The instrument you mention was good eight or ten years ago, but has since been superseded by better instruments. 4. For the purpose you describe we should select No. 3.

OLD SUBSCRIBER B. B.—Gum Regialine is an American preparation, sold for the purpose of mounting photographs ready for use. Of its nature or qualities we have no information.

G. Y.—There is only one work published on the subject of photolithography or photo-zincography; that is the work of Col. Sir H. James, published by Messrs. Longman at 12s. 6d. It does not enter into minute technical details of the process.

F. W. P. (Chelmsford).—Mr. Morley, of Islington Green, whose announcement you will find in our advertisement pages, is the most likely.

Q. Y.—Primarily, the collodion you use is not the best suited to the purpose of transferring. It has not sufficient body, and does not give a tough, tenacious film. The wax should be rubbed off the plate, but still a thin and almost imperceptible film should be left on. The addition of a few drops of a saturated solution of wax in ether added to an ounce of collodion will facilitate the transfer. From your letter we glean that you apply the gelatine to the collodion film. This is not right. You should

have gelatinized paper ready for use, which should be applied to the wet film and pressed in contact. If the gelatine be applied warm to the plate it will sometimes permeate a porous collodion, and make it difficult to transfer; but the gelatine on paper merely becomes adhesive by contact with cold water, and could not permeate the film. We have recommended the use of plain gelatinized paper for the purpose of getting rid of the high glaze which you seem anxious to secure. To secure this in its perfection you should use the enamelled paper prepared in France expressly for the purpose, and which is sold ready for applying to the wet film without further preparation. The wet method of transfer is the simplest, but if you prefer the dry you may facilitate the transfer by adding a little alcohol to the water in which you immerse the plate before stripping. The plate you sent to us we immersed for an hour in warm water, and removed the film without difficulty, but found that the film was not very suitable. The printing and toning were good. The card you send is an albuminized print treated with gelatine and collodion, or "enamelled," as it is termed, in the manner we have often described. Those of Disderi's are, on the contrary, camera-printed images on collodion, transferred to the French enamel card or paper—to which we have just referred—and then mounted in the ordinary way.

E. KENYON.—Mr. Hart, whose address you will find in our advertising columns, will, we believe, supply them. 2. A clean, thin, delicate transparency is necessary for the lantern when a weak light is used, and the weaker the light the more clean and delicate the transparency should be; but there is no special mode of producing transparencies suitable for lamps with weak light. 3. Read the article on Double Printing in our YEAR-BOOK for 1864. Where an object projecting into the sky is large, it is necessary to cut a mask to fit it; but in case of flag-staffs and similar objects, you may print your cloud negatives over them without danger.

D. G. (Fews).—Your question is scarcely quite clear. You ask why the albumen leaves the paper after toning, and refer us to the card enclosed as an example; but the card affords us no evidence that the albumen has left the paper, as it possesses an even, good surface, although not very highly glazed or albuminized. Possibly you mean that the surface of the finished print is not as highly albuminized as the original paper. Such a thing may happen from two causes: either the use of a nitrate bath deficient in silver, or too short floating on a strong nitrate bath. In either case the whole of the albumen film is not perfectly coagulated, and a portion of it is dissolved in the subsequent operations of toning, fixing, and washing. The lighting and general qualities of the card are pretty good.

R. S.—The edges should be turned up, so as to make a dish of the picture, and the gallic acid solution poured in. 2. After developing wash well, and then fix in hypo in the usual way.

H. W.—We have not ourselves tried the chloride of lithium or tartaric acid in the collodio-chloride of silver process, having had difficulty in getting good results with our own formulae. The chloride of strontium we prefer, and citric acid. See our last YEAR-BOOK. If you use chloride of lithium, little more than half the proportion necessary of the strontium salt must be used. Tartaric acid may be substituted for the same quantity of citric acid. The formula mentioned is suitable for paper or glass. 2. Vigour and depth depend partly on the presence of free nitrate, and on the presence of citric acid; and also somewhat on having plenty of body in the collodion. 3. The chloride of calcium for drying purposes may be dried in an oven.

BETA.—We will give you our best opinion when the specimen arrives.

PHOTOTYPES.—We have received from some correspondent two examples of phototype prints, from pen-and-ink sketches, but no advice or memorandum concerning them.

H. S.—See notes on the rectification of your bath on another page.

J. L.—The name is, as you suppose, merely one of the many aliases of the same person. It is not of sufficient interest to be worth exposing.

HYPO(CHLORHYDRIAC) has not sent us his name in confidence.

Several articles in type are compelled to stand over until our next.

Several Correspondents in our next.

Photographs Registered.

Mr. R. P. REEKS, Eastham,
Photograph of Mr. W. Crowther.
Mr. J. D. WAYMOUTH, Nailsea,
Two Photographs of Rev. F. Brown.
Messrs. DOWKIN, Newcastle-on-Tyne,
Photograph of Justice Lush.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
The Use of Common Water in Photography.....	133
Photographic Exhibitions in London	134
Photography in South Africa	134
Photographic Piracy.....	135
Pictorial Effect in Photography. By H. P. Robinson.....	136
Some further Experience with Hyposulphite of Ammonia in the Toning and Fixing Bath. By Nelson K. Cherrill	137
The Magic Lantern and Photography. By James Martin.....	138
Last Words of Sir D. Brewster on Photography	139

	PAGE
Further Remarks upon the Use of Permanganate of Potash. By J. R. Johnson	139
Photographic Difficulties of an Amateur in South Africa. By Dr. Mann	140
Proceedings of Societies—South London Photographic Society ..	141
Correspondence—Photography and Disease—The use of Distilled Water—Blisters in Albuminized Paper	142
Talk in the Studio	143
To Correspondents.....	143

THE USE OF COMMON WATER IN PHOTOGRAPHY.

THE use of distilled water in photography, especially for the nitrate bath and some other purposes, has so long been held as one of the most sacred canons of the art, that any suggestion to supersede it by the use of common water is regarded by many as rank and dangerous heresy. In a correspondence which has appeared in our columns during the course of the last few weeks this question has been discussed, Mr. Nelson Cherrill taking the initiative in advocating the disuse of distilled water and the use of common water for all photographic purposes. In this recommendation he is joined by some others, especially by a photographer so capable and experienced as Mr. Russell Sedgfield, who states that for many years past he has abandoned the use of distilled water in all his photographic operations.

If distilled water always meant pure water, and secured the immunity from the troubles which impurities in the bath engender, the mere question of its slight additional expense would be scarcely worthy of consideration, and we should be indisposed to entertain any suggestion for its abandonment; but it unfortunately happens, as the experience of too many photographers bears witness, that distilled water is frequently not pure water, and that fog and other defects in a new bath, which have caused weeks of trouble, have, after an exhaustive process of searching, been traced to the distilled water of which the bath was made. Dr. Anthony, in our YEAR-BOOK for 1867, pointed out the difficulty in obtaining distilled water free from organic contamination: the use of the same apparatus for distilling essential oils and distilled water, carelessness as to the luting, and a variety of other causes, tending to the impurity of the water even when distilled purposely; whilst the use of the water condensed from waste steam is another fertile source of trouble in what is supposed to be pure water.

Seeing, then, that distilled water is too frequently impure, and is often an unsuspected source of fog, it becomes worth while to enquire whether it cannot be dispensed with altogether. In suggesting the use of common water, the first difficulty which arises is the indefiniteness of the term and the variability of the substance. The meaning the term is intended to convey is the water in common use for domestic purposes, such as drinking, cooking, and lavation. This, of course, is derived from various sources, and is of very variable quality. In most large towns in the present day there is a water supply from some river or lake; in some cases it is obtained from wells; and in a few instances from the rainfall. In all these cases it is certain to contain more or less of organic contamination; and in the two first cases the water generally contains in solution various inorganic bodies, chiefly chlorides and carbonates. In London the water supplied by the different water companies varies a

little in quality, but contains an average of from 17 to 20 grains per gallon of inorganic matter (chiefly chloride and carbonate, calcium generally furnishing the base), and from 2 to 3 grains of organic matter per gallon.

As a general rule, these substances can be easily removed by the action of light and oxide of silver. Half a dozen years ago, Mr. Barter, at the North London Society, expressed a conviction that if a nitrate bath were rendered alkaline and sunned before use, it did not matter whether it was made of distilled water or not. At the same time he exhibited various examples of distilled water to which he had added one grain per ounce of nitrate of silver, and then exposed them to light. In all cases they exhibited the presence of organic matter.

Incidentally, he pointed out the importance of rendering the weak silver solution alkaline before exposing it to the light: a sample rendered alkaline and exposed to light had precipitated its organic matter and become clear; another sample, rendered just neutral, and exposed during the same time, had become black and turbid; whilst an acid sample, under similar treatment, became discoloured under the action of light, but gave no precipitate.

With the water of the New River Company, in London, we have for years made printing baths, and have never experienced any difficulty, and with the same water we have, adding a grain or two of nitrate of silver per ounce and sunning, made a negative bath which worked well. Mr. England informs us that in his last summer's tour, in which he worked only dry plates, he rarely used distilled water for washing them, the water accessible in the majority of instances being rain water. Mr. Mudd remarks that in his dry plate operations he never uses distilled water for washing. Mr. S. Fry has for many years, and in different parts of the country having different qualities of water, used only common water for the preparation of the printing bath, and has derived the positive advantage of preserving the solution from becoming discoloured. We might multiply examples in which the disuse of distilled water, for all purposes but the preparation of the negative bath, had been attended by success, if any good purpose could be served by enforcing the argument.

But our chief purpose is to point out that one of two courses is desirable in regard to water. The photographer should distil water for himself, or resort invariably to some means of purifying the water distilled or otherwise, before employing it for a negative bath. An intelligent correspondent—who, in reply to Mr. Cherrill, strongly enforces the importance of using distilled water, and speaks of the certainty to be derived from its use—explains the satisfaction it has afforded him, by mentioning the fact that he distils for himself. Photographers who purchase distilled water should, before making a nitrate bath with it, either add about a grain of nitrate of silver to each ounce, with

sufficient caustic potash to render it alkaline, and then sun it; or add a trace of permanganate of potash to it. In either case they oxidize and get rid of the organic contaminations so commonly present, and secure pure water for the bath. This might be done with a stock of water in advance, and would generally save the subsequent trouble, too frequently necessary, of sunning a new bath before satisfactory results can be obtained.

The second course is perhaps simpler, and will be found, we believe, as efficient; but it involves the heresy of discarding distilled water. Since the latter will generally require purifying before it can be used with safety, it is just as easy to begin by purifying common water. This may be effected by means of permanganate of silver, which will remove at once both organic and inorganic impurities, and yield the much desiderated article—pure water. Permanganate of silver is not at present an article in commerce, but will doubtless soon become so if a demand for it should arise. Those of our readers accustomed to chemical manipulations may easily prepare it for themselves, by mixing warm solutions of permanganate of potash and nitrate of silver in equivalent proportions,* and, on cooling, the permanganate of silver will separate in needle-like bronze-coloured crystals. This will be found to be soluble in the proportion of 4 grains to an ounce. The purple solution added to common water, a little at a time, until it ceases to lose colour, will effect the purification required.

PHOTOGRAPHIC EXHIBITIONS IN LONDON.

THERE are, at the present moment, three or four exhibitions of photographs in London which, although not extensive, are interesting, and will repay the trouble of a visit from those of our readers who have opportunity.

At Colnaghi's, at the West End of London, and at Leggatt and Hayward's Gallery, in the East, may be seen an extensive collection of carbon prints, produced by Braun, of Dornach, by Swan's process. They consist of reproductions of the drawings of the most famous of the old masters, which are found in the Louvre at Paris, and the galleries of Vienna, Florence, and other continental cities. Many of these are from studies in red chalk, *sepia*, &c., and are, in each, reproduced in facsimile, and are, in many cases, undistinguishable from the originals. Of the beauty of these results, and the inestimable value of this process for multiplying and perpetuating the rare and, in many instances, the already perishing drawings of the grand old masters, we have often spoken, and need not dwell on the subject now. We rejoice to know that, by the operation of a company now in the course of formation, the same permanent reduplicating process will shortly be performed for the almost unknown art-treasures at present buried in the British Museum, and other collections in this country. One of the most important applications of photography, the popularization of works of fine art, has hitherto been almost overlooked, if not quite neglected, in England. It is satisfactory to know that, now that it will be commenced in earnest, a permanent printing process will be employed in effecting it. In the meantime, we recommend our readers to form an idea of the importance of such a project by visiting either the exhibition in Cornhill or Pall Mall now open.

At the German Gallery in Bond Street, Mrs. Cameron exhibits a very extensive collection of her studies and portraits. Our own opinion on this style of work has been already recorded. There is, in many cases, much evidence of art feeling, especially in the light and shade, the composition, so far as form is concerned, often being awkward. The subjects of many of the portraits—such as Sir John Herschel, Henry Taylor, Holman Hunt, Alfred Tennyson, and others—are full of interest in themselves, and are often noble in form and appearance, a circumstance which alone gives a value to the exhibition. Not even the distinguished

character of some of the heads serve, however, to redeem the result of wilfully imperfect photography from being altogether repulsive: one portrait of the Poet Laureate presents him in a guise which would be sufficient to convict him, if he were charged as a rogue and vagabond, before any bench of magistrates in the kingdom.

The attempt at the Crystal Palace to reproduce, in instalments, the best portion of the British display exhibited in Paris last year, can scarcely be called a success. Of the photographic contributors, only five put in an appearance at Sydenham. Mr. Blanchard exhibits some large heads and portrait studies, which have very fine qualities. In addition to the Zealot and a Praying Monk, which were in Paris, there are some large heads with much of the old-master-like effect—to coin a phrase—of Mrs. Cameron's productions, without the slovenliness of execution. A head of Mr. Blanchard himself is very fine, round, rich, and finely modelled. Some other heads are characterized by the same massiveness and force. Mr. England exhibits a number of his charming Swiss views, in which it is interesting to note that those produced from dry-plate negatives are absolutely a little softer and more delicate than the prints from wet-collodion negatives. Mr. Pouncy exhibits carbon prints on paper, canvas, and wood, of various degrees of excellence, some of them being exceedingly good. M. Adolphe Beau has some fine portraits, possessing much art excellence. Messrs. Caldesi exhibit some interesting medallion portraits, in which the portrait is surrounded by a name or description, produced on the medallion by double printing, in the manner described some time ago in our pages.

PHOTOGRAPHY IN SOUTH AFRICA.

IN Dr. Maun's interesting record of the difficulties of an amateur in practising photography in South Africa, which will be found on another page, there are two or three experiences which suggest a word or two of comment.

One of the circumstances recorded, as stated, appears sufficiently startling, especially when regarded in the relation to canons which at one time prevailed in relation to the nitrate bath. He describes the extraordinary success of a friend who was in the habit of pouring nitric acid into his bath in an unmeasured stream, "revelling in a nitric acid sea of unknown and unguessed depth." As we fancied on listening to the narrative, we found, on subsequent inquiry, the doctor's friend used in this bath a collodion containing a large proportion of a bromide. The nitric acid, which, used in conjunction with a simply iodized collodion, or one containing only a trace of a bromide, would produce total insensitiveness, with a freely bromized collodion not only secures cleanliness, but permits a very high degree of sensitiveness. We do not here enter into the *rationale* of the question, but simply recall the fact too little known, or frequently forgotten. The fine, large, instantaneous pictures of Colonel Stuart Wortley were produced in a nitrate bath containing from two to three drops of nitric acid in each ounce of nitrate solution; and the collodion employed contained not less than two grains of a bromide in each ounce of collodion. A thin, delicate, fully-detailed image was obtained with these materials, with very short exposure, the requisite vigour being secured by subsequent intensifying. We refer those interested for further details to the paper of Colonel Stuart Wortley, which appears in the *Photographic News*, vol. vii., p. 76.

Another difficulty referred to by Dr. Mann is the rapid glutinizing of the collodion by the evaporation of the solvents, which was not got rid of by the addition of fresh alcohol and ether. This the doctor refers to certain improvements introduced into the manufacture of collodion some eight years ago, as anterior to that period he never experienced such troubles. The "improvements" here referred to consist, probably, in the more common use of cadmium salts in collodion, which tend, especially with some samples

* 170 grains of nitrate of silver to 158 grains of permanganate of potash.

of pyroxyline, to gelatinize the collodion and render it unmanageable if used too thick. In the use of cadmium salt^s there is at times a balance of advantages and disadvantages: whilst they render the collodion more stable, and preserve sensitiveness, they also tend, if used with a pyroxyline yielding a horny film, especially when newly mixed, to glutinize the collodion, rendering it difficult to coat a large plate without producing a lumpy, uneven layer. There are two remedies for this: the use of a pyroxyline made at a high temperature, and somewhat dilute acids, which yields a limpid collodion, the physical properties of which are not so readily injured by the cadmium; or adopting the practice of Mr. England, whose collodion is generally mixed at least a twelvemonth before it is used. The addition of a portion of an alkaline iodizer is, of course, valuable in checking this tendency to glutinosity in the collodion; and when brouides are freely used, a collodion so prepared will preserve its sensitiveness for many months, even at the high temperature of the tropics.

Probably, for amateur purposes, a good dry process, such as Mr. England's, would involve the fewest difficulties. The plates could be prepared in the evening when temperature is cool, and as many days in advance as by experience the plate may be found to keep perfect. The impedimenta of the tourist would be thus reduced to a minimum, and, whilst his anxieties and risks would be materially reduced, his attention could be solely devoted to the selection of his subject. The plan adopted by Professor Piazzi Smyth, of exposing the plate whilst in the bath, scarcely seems adapted to meet the difficulties described. If it be difficult to get a film free from lumpiness on the one hand, and reticulation on the other, it is clear that negatives possessing such physical defects will yield but sorry enlargements.

PHOTOGRAPHIC PIRACY.

THE meanness and immorality of piracy are so manifest to simple-minded, honest men, that it should seem something like a waste of words to enter into discussion to prove its iniquity. When one man has expended time, thought, and money in giving embodiment to an idea of which he hopes to reap the profit to be derived from introducing it to the public, it cannot require argument to prove the dishonesty of him who filches that idea, and deprives its owner of his legitimate profit. Nevertheless, it is possible to surround the subject with complications sufficient to bewilder the thoughtless, and to enable the dishonest to urge some specious pleas in justification of their mal-practices. We ignore the plea of public utility which has been put forward, inasmuch as it is perfectly clear that public utility can never be served by private wrong. But it was at one time plausibly urged that where publishers of engravings had, for the purpose of increasing their own gains, neglected to comply with the conditions upon which the law guaranteed them protection, they had practically surrendered their copyrights, and given the public a right to take possession of that which had virtually become common property.

In the recent cases at the Guildhall, in which conviction has been followed by heavy penalties, there were, however, neither complicating nor extenuating circumstances. Well-known copyright engravings, in regard to which all the requirements to secure legal protection had been satisfied, were extensively and knowingly pirated, and the penalty inflicted was most richly merited. Nevertheless, if the statements of an esteemed contemporary are correct, there are circumstances connected with the mode of detection which are calculated somewhat to lessen the sympathy with the grievously wronged prosecutor. The *Stationer* complains of a system in which the unwary, and possibly the ignorant, are entrapped into breaches of the law by the artifices of hired informers whose sole object is to secure a conviction. We quote at some length from our contemporary:—

"Mr. Graves is perfectly justified in protecting his rights,

but we do not like the spy system he has established. Such a principle is thoroughly at variance with English notions, and ought not to be countenanced. Persons who are willing to try to entrap others into committing an offence are themselves morally guilty. Indeed, they are a nuisance to society, and cannot be styled respectable members of it. We do not assert that Mr. Graves has ordered his myrmidons to resort to underhand ways to detect offenders against the law of copyright; but we opine that any man who will permit himself to follow the occupation of a hired informer is an individual who will not be over-scrupulous as to the means he employs to attain his end. *Apropos* of this, we know instances where *quasi* customers have called upon vendors of photographic scraps, and urgently asked them to procure certain copyright pictures. A few days after their proposal has been made a stranger has opportunely called upon the dealer, and offered some of the precise photographs that were required. He has asserted that he is in pecuniary difficulties, and must realise his stock at any sacrifice. Tempted by the favourable terms of purchase, and feeling compassion for the assumed wretchedness of the traveller, hawker, or whatever he may be, the shopkeeper makes a random bid, which in the end is accepted. Again the customer calls, and expresses his great desire to possess the copies previously asked for. In an unguarded moment the dealer exhibits his illegal purchase, makes an illegal sale, and so brings himself within the meshes of the law. This is no isolated case; and though we cannot assume that there has been collusion or conspiracy between the impecunious man and the lavish customer, it is not without the range of probability. It is therefore possible that some of the prosecutions instituted may have had their origin from such circumstances as are above indicated, though we acquit Mr. Graves from being a party to such proceedings. That gentleman is a patron of high art, and expends his money with a lavish hand. It is therefore a duty he owes to himself to protect his interests, though we fail to see what pecuniary loss he sustains in the individual transaction when one of his own servants buys for his own use copies of his own works. The loss can only be a presumptive one, founded on the idea that other copies have got into circulation. In the prosecutions referred to several months were allowed to elapse before proceedings were instituted; and in permitting such an interregnum to occur we consider Mr. Graves to have committed an error. Having in view the ruinous effects of dealing in copyright photographs, we hope that our subscribers will refrain from dealing in such contraband ware. And they must bear in mind that the number of prosecutions which are reported in the papers do not represent the whole of the proceedings that are instituted, inasmuch as many actions have been privately settled. It is also well they should know that not only are they liable to be fined, but they also lay themselves open to a civil action for damages. The law, therefore, permits them to be doubly amerced for the commission of one offence, than which there cannot be a more unjust enactment. To punish a man twice for the same offence is not in accordance with our national views of jurisprudence, and the law which allows it should be repealed."

In reference to the last remark, it must be borne in mind that the punishments permitted are of a widely different nature, and can scarcely in both cases be regarded as punishments inflicted by the law. The law inflicts a penalty for a breach of its own provisions. But besides breaking the law, the pirate robs the owner of the copyright of a portion of his profits, and the law permits him, on proving his injury, to recover damages to such extent as he can show that he has suffered. His interest in the penalty may very inadequately recoup him for his losses, and surely there is nothing unfair that the honest trader should receive compensation for his losses to the fullest extent they can be proved to exist. Further, if piracy can be made unprofitable, it will soon cease to be practised.

In regard to the employment of informers, we hope that

Mr. Graves and others in his position neither instigate nor encourage such a system; for whilst they have suffered grievous and irritating wrong, the use of such vile tools will scarcely secure a remedy, or, at any rate, not without risking much injury. The informer's net will probably secure shoals of the ignorant, unwary, and comparatively innocent dealers, whilst the greatest and most cunning offenders will escape scot free. In the recent cases there can be little doubt that the offenders risked the penalties with their eyes open, and no sympathy need be wasted on them on the score of being entrapped into the offences of which they were convicted.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER VIII.

"What is beautiful must be decided by each man for himself and at his peril. There are some who maintain that all nature is beautiful. Fortunately, we can now disprove this monstrous position by our daily experience of photographs. Even if they were quite true in effect, form, or expression, they would often be none the less ugly. They are usually planned and made by men of some chemical knowledge, but tasteless and entirely unacquainted with fine art. Consequently, the photographers unconsciously offer us the mean and ugly mixed up with some beauty."

Fine Art Quarterly Review.

COMPOSITION based on the diagonal line—the form of arrangement to which the foregoing chapters have been principally devoted—having been considered, it appears to be a fit time to say something on landscape composition generally, the more so, seeing that I have already urged the student to accompany his study of these lessons by practical attempts to carry out the instructions from time to time brought under his attention. A few hints on his general mode of procedure in attempting landscape work may, therefore, be of service here.

Elegance in landscape composition, in views where no extraordinary object suffices in itself to engage the attention, appears to demand free sweeps of lines contrasting each other; a fine vigorous foreground, which—especially in photography—should be made use of to govern and correct those parts of the picture which are beyond the control of the artist; a middle distance that delicately melts into the distant mountains and into the sky. Lines, and light and shade should be so arranged that the eye is led into the picture and allowed something to rest upon; that something should be the *theme* on which the picture is built. If there are any ugly lines in the view that cannot be got rid of by change of position, or by opposing lines, or masses of light or shadow in the foreground, then the background of the landscape—the sky—must be made use of, and, by the disposition of the clouds, much bad composition may be remedied.

There are several things worthy of the careful consideration of the landscape photographer before he packs up his traps and takes the field. The first is a meteorological one.

Without a favourable state of the weather, the most perfect manipulation and skilful arrangement would be worse than useless; they would be thrown away upon subjects that might have been better done under more propitious circumstances. Nothing is more annoying to a conscientious photographer than to know that a greater degree of perfection might have been attained than that which he has effected, except, perhaps, the possession of a negative too good to destroy, but not good enough to print—a negative just so much short of perfection as to cause regret that it ever was done.

The most perfect day for pure landscape operations is one on which the wind is still; and when I say pure landscape I do not include sea-views, which are, perhaps, more grand, if not more beautiful, under the influence of wind than in a placid condition. It has been said that nature is insipid when in a quiescent state, and that it would be better to sacrifice

sharpness than to tolerate tameness; but, apart from all photographic considerations, what can be more beautiful than the majestic calm of a still landscape? The great charm of a fine twilight consists more in the serenity and quietude that reign at that period of the day when—

"All the air a solemn stillness holds,"

than in the fading light and in the dying of the day. Incidentally, another fine effect of contrast may be here mentioned. Who, when taking an evening walk in the country, has not felt the effect of the twilight calm increased and enhanced by the sudden sound of the slamming of a distant gate, or the bark of a dog in a neighbouring farmyard?

Of all faults photographs possess as pictures, that caused by the motion of the object photographed is one of the worst. This is especially true of foliage; and if a negative is found to have this defect to any degree, it should be rubbed out at once. Still waters, as a rule, are best on quiet days. Gusts of wind partially skimming over a lake adds surface to the water and vivacity and life to a picture, it is true, but there is great beauty in the grand reflections in still water, which is so exquisitely rendered by our art.

The light, usually held to be of the first consideration in photography, is here placed second, because if the subject be not in a fit condition to be photographed, it would be useless to have it well lighted. It should be taken as an axiom that most landscape subjects should be sun-lighted. Nature certainly looks more beautiful in sunlight than in shade (there are, of course, exceptions). A landscape without sunlight, especially if it be an extensive view, is usually flat and low in tone, and this tameness would certainly not be lessened in the photographic transcript, for if a subject have not sufficient breadth of light and shade to give relief, the landscape photographer's powers of producing that desirable quality are very limited, and the attempts to do so generally result in hardness; besides, who would prefer the cold, dull, prosaic effect of daylight to the warm, cheering glow of "nature's smile."

In selecting a sunny day it is not necessary that a cloudless sky should be chosen; on the contrary, a dark blue sky is very non-actinic, and a day on which white clouds float lazily over the heavens, occasionally obscuring the sun, a day that often comes after rain, when nature looks fresh and cheerful, is the best that could be chosen for landscape photography.

The choice of a subject is the next thing that should claim the attention of the photographer; and now will be the time when the student will show his capability in artistic treatment. Here let me earnestly entreat the student to follow my advice in one thing: let him determine to be content at first with one subject; to work at it with all his heart and soul until he has got the best possible representation of it. Even if it take a summer, let him determine to produce a masterpiece. A complete triumph over one subject is worth more, both as a study and as a picture, than the indiscriminate picking up of any quantity of dull and feeble commonplaces. If a lot of mere photographs are wanted, it is better to send a man to manufacture them; it will be found much cheaper also; but the study necessary for the production of a perfect photographic landscape is worthy of the attention of a superior intellect.

Now comes the question how to produce this masterpiece.

It is of no use taking a camera with you the first time you visit unknown ground in search of subjects. When you have selected your subject, and are satisfied it will make a good picture, let it command your individual attention. Consider it as a painter would, if he were going to make a large and important picture of the scene; consider the best time of day; visit it several times during the day to notice how the changing position of the sun alters the light and shade and shape of the masses. It is too often the practice of photographers to work with the sun behind the camera, so as to get all the light possible on the subject, forgetting that it is not light alone that they want, but light and shade. The charm of sunlight depends very much upon aspect. This

must be carefully considered by the student. Some subjects are better with the sun coming from the side, and others with the sun more behind the view, skimming the edges of objects only with its rays. Having chosen the subject, then fix the exact spot for your point of view; this will give you less to think of when you bring your camera next day. Remove any obtrusive boughs that appear likely to interfere with the view. And, lastly, think if there is anything you could do to improve the already well-considered composition. Make up your mind if a dark or light spot is required in the foreground to give balance, and if a figure would answer the purpose, and what kind of figure, bearing in mind that broadcloth and black hats are no improvement to a country landscape, and that harmony between animate and inanimate nature must be imperatively preserved.

When you are perfectly satisfied that your view presents the best possible aspect, that you have your figures and all else quite ready, you may begin to think of your chemicals, which I would rather you consider as your tools, over which you have perfect command, rather than as a series of scientific problems on which you are about to make experiments.

There are other considerations which I intended to include in this chapter, but I have filled my space, and must reserve them for the next.

SOME FURTHER EXPERIENCE WITH HYPOSULPHITE OF AMMONIA IN THE TONING AND FIXING BATH.

BY NELSON K. CHERILL.

As I mentioned in my paper on the use of Hyposulphite of Ammonia (published on the 7th of February) that I proposed to continue my experiments with that substance, and that should any further successful results be obtained I would send a further communication on the subject, so now I intend to do. I have, since the publication of my former paper, continued my experiments with much success; and, having a few more observations to make on the use of hyposulphite of ammonia, I think it time to send some illustrations of the progress made up to this time.

In the first place, I have availed myself of the thoroughly practical suggestions contained in the leader on the "Elimination of Silver from the Whites of Albuminized Paper Prints" (page 61), and with considerable advantage. In my original formula I used two drachms of sulphate of ammonia and three ounces of hyposulphite of soda. The paper above referred to says, use an ounce of the ammonia salt. Now, my idea was, that the hyposulphite of soda would do almost all the fixing, and that its action only wanted to be very slightly supplemented by a little of the hyposulphite of ammonia to render its action quite perfect; and therefore I suggested adding only so small a portion of the sulphate of ammonia as two drachms. I have, however, tried the larger, or, at least, a larger, portion of this salt, and find from it great advantage.

Having tried this, to satisfy myself as to the practical working of the bath I made up the following, using up in it the old bath mentioned in the News of February 7th, and which had been made up some days previously:—

Water	...	...	...	16 ounces
Hyposulphite of soda	...	...	6	"
Sulphate of ammonia	...	about	1 ounce	
Acetate of soda	...	...	2 drachms	
Gold	...	...	10 or 12 grains.	

The gold which I use is only very slightly acid, if at all. To correct any acidity, however, which it might convey to the bath, I added just a trace of ammonia to the solution before putting in the gold (somewhere about one-third of a drop). If the gold were very acid, no doubt the safer plan would be to neutralize it separately.

This bath has remained in occasional use ever since, and is now, to all appearance, in as good working order as it was at first. I have made up waste from time to time with

a little fresh solution of hyposulphite of soda, and each time of using it I have added just a little gold, to prevent it from "jibbing," as Mr. Hughes says. I have treated the solution with no particular care, always leaving it in the dish in the dark room. At first I left it uncovered, as recommended by Prof. Towler, but finding dust, &c., accumulate, I filtered it, and have since kept it covered up with a glass plate when not in use.

I am sorry that I have no record of the number of prints which have been fixed in the bath, but there have been a considerable number from first to last. The only apparent effect produced in the solution is a very slight discolouration and a little sediment; this latter I attribute entirely to the chloride of silver being precipitated by the impurities of the water, as I have, of course, used only common water in these experiments. This precipitate, when the bath is used, becomes stirred up, and renders the solution milky, but does no further harm. I have not, in any instance, washed the prints before immersing them in the solution. In some instances I have toned prints four days after printing (two of the horses sent are done so, and the other printed and toned the same day), and I have found no difference in the result. Any kind of paper seems to tone well (I mean any good paper), and the results are equally good with a 60-grain bath or with a 20-grain and gelatine, as recommended some time ago by Mr. Palmer.

Your readers will now be anxious to know what are the fixing powers of the bath after being so used. I will proceed to describe the treatment of the two half stereo prints which have been tested for silver in the whites.

Messrs. Mawson and Swan, with a courtesy which I have always received from them, had no sooner read my last paper in the News than they sent me a letter stating that, to aid in my experiments, they had forwarded me some hyposulphite of ammonia, in order that I might try its effects. The next day the salt came in a railway parcel, done up in several sheets of paper. The appearance of the stuff is that of the soda salt, and it has about the same moisture; it has been kept ever since in a stone jar, with a loose cover, without getting any more moist. Just as I was about to use this sample for some experiment, a letter came again from Messrs. Mawson and Swan, stating that, by accident, an impure sample had been sent me, at the same time asking me to put it on one side and wait a day or two for a fresh supply. Of course, under these circumstances, I did not use any of the impure salt to form a toning bath; but I have used a solution of it, one ounce to about eight of water, as a *refixing* solution for the prints after they came from the bath above mentioned. The last batch of prints from the toning bath were passed through this refixing solution, each print remaining in it about three minutes.

The two half stereo prints (enclosed) are typical examples of the result produced: the one of a dark tone having been a full time in toning bath, and so exposed, of course, to its most perfect fixing action; and the other, of a browner colour, which was produced in a comparatively short time in the toning bath. Both these were treated, after the extra fixing mentioned, with a solution of hydrosulphate of ammonia one drachm, water one ounce. The dark one enjoyed the influence of this solution for fifteen minutes, the light one for ten minutes. It will be seen that, though the *half-tones* have been turned very yellow by this solution, the whites are very little stained by it; certainly much less so than those I formerly sent, and very much less than would be the case with prints fixed only in the soda* salt in the usual way. The general quality of the toning may be judged of by the few samples enclosed.

I think, from what I have stated, we may conclude that the

* It should here be stated that this experiment illustrates that the use of a second fresh bath of hyposulphite of soda is valuable in diminishing the amount of silver left in the whites, the imperfection in the sample of hyposulphite of ammonia consisting in the fact that it contained a large proportion of hyposulphite of soda, as we ascertained from the examination of a sample sent to us at the same time.—Ed.

toning and fixing bath made up as recommended is certainly a solution which deserves further investigation; its results are certain, its manipulation easy, the tones it gives are good, the time it takes to produce them is not excessive, and, finally, the fixation, aided by a short immersion in hyposulphite of ammonia (a confessedly imperfect sample, too), is perfect; for I think if priuils will stand the test to which these have been submitted there is not much fear of their fading from silver left in the whites; that is, from imperfect fixation.

I hope to investigate the matter more fully anon, and look forward with much pleasure to the receipt of the *pure* sample of hyposulphite of ammonia promised from Newcastle, as I cannot but think it will prove even more efficient than the mixed salt hitherto recommended. It does not seem to me there will be any difficulty in getting this ammonia salt when wanted, as another chemist, of high repute among photographers, says, in a letter received a few days back: "I shall be happy to supply as much hyposulphite of ammonia as photographers call for."

I hope that those photographers who take an interest in these experiments will make some trials for themselves, as it would be useful and good in all ways to have the results I have described confirmed by independent testimony; and should any discrepancies arise, the discussion of them could not fail to elucidate some point of interest connected with the matter, and might add greatly to the usefulness of these remarks.

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 8.

SINCERELY hoping that the instructions given in the foregoing papers will enable those of my readers who persevere to paint and mount in its holder the photographic transparency or outline with success, I now proceed, according to promise, to describe the various sorts of lanterns, their appliances, how to light, and how to use them.

Lanterns are made of various sizes, governed by the size of the lenses to be used; therefore, before commencing to make one, that question must be decided, as it will not only govern the size of the lantern, but its cost, its portability, and its general utility. The most useful sizes are those having the condensers of from 3 to 4 inches in diameter. A smaller-sized picture than 3 inches in diameter will contain very little subject-matter. When the condensers are above 4 inches in diameter, the expense of everything belonging to the apparatus is enormously increased, it becomes very cumbersome, and only fit for a large hall or public lecture-room. As 3½-inch pictures are almost universally sold, and to this sized lantern the quarter-plate lens can be fitted as objective, I will give the details and mode of construction of a suitable lantern.

The bodies of lanterns are usually made of japanned tin, sheet iron, zinc, or other suitable metal; they are also made of wood lined with metal. The top and chimney should, in all cases, be made of metal only; and the joints seamed, not soldered, as the great heat might cause the solder to run. When the body is made of wood, the parts should be screwed together like a well-made camera. The dimensions of the body of a lantern for lenses of the size recommended are as follows:—Height, 15 inches; length, 8½ inches; breadth, 6 inches; height of the chimney, 13 inches; diameter at the base, 4½ inches, tapering to 2½ inches at the upper small end, where it must have a crook or bend, to prevent the light from showing into the room. I prefer having a door at the back and side, and this plan will be found most convenient. The door may be about 4 inches wide, and must be of sufficient height to allow of the lighted lamp, with its glass chimney fixed, being placed on the lamp-stage while being held upright. There must be a stout wire handle affixed to the upper part of each of the two sides. The door is placed on the right-hand side, except when

lanterns are made to be used in pairs; in that case the doors are one on the right-hand side of one lantern, the other on the left-hand side of its fellow. A circular orifice is made on the top, round which a collar is fixed of about three-quarters of an inch in depth, in which the chimney fits. In the front a round orifice is made of 3½ inches in diameter, and its height from the base must be governed by the height of the lamp or other means of lighting to be used, and so arranged that the centre of the flame shall be opposite the centre of the orifice. The nozzle of the lantern consists of a cone with an aperture corresponding with that cut in the front of the body, and placed at its larger end upon a metal plate, to be fixed at a distance of one inch from the lantern, having inside this plate another which is allowed to play freely in front of the body by two springs. The slide is placed between the loose plate and the body. The nozzle may be made to slip on and off the front of the body; this method will be found very convenient for packing, as when two lanterns are used the chimneys and lamps can be packed in one, and the nozzles with their lenses in the other, and the whole contained in a square box of comparatively small dimensions. In front of the cone there are two tubes fitted, one within the other, so that the inner one slides easily in and out in the outer one; and at the back are placed the focussing lenses when it is intended that a portrait combination shall be used. I should recommend that either the cone should be turned of wood, or have a wooden face at its smaller end, so that the flange of the lens may be screwed to it. This method will prevent any necessity of trusting (perhaps) a valuable lens in the hands of an unskilled workman, a proceeding most certainly to be avoided. Inside the lantern, close and opposite to the opening cut in the front, must be placed the condenser, fitted in a bolter or flange as may be. About one inch from the bottom is placed the lamp-stage, having a sliding arrangement to regulate the distance of the lamp from the condenser, and moved to and fro by means of a wire handle passing through the back of the lantern. A small circular rim is made in the centre of the stage, in which the lamp is placed; and in the centre of this rim a hole is cut to enable air to pass up the tube of the lamp. Holes are also cut round the sides for the purpose of ventilation. The lamp-stage can be so arranged that it can be removed altogether, and the hydro-oxygen light used when required.

The efficiency of the lantern depends in the greatest degree upon the quality, position, and suitability of the lenses employed. If they are not of the proper description and focus, and placed at the right distance from the light and from each other, no satisfactory result will be obtained. The use of the largest lens is to concentrate or condense the rays of light from its source upon the focussing lenses, and, by thus bringing them into proper relations, increasing the brilliancy of the picture thrown on the screen. This lens is called the condenser. The glass used for the condensers should be of the very best quality, free from specks, bubbles, and striae, especially when a strong light is used, as every imperfection is then shown and enormously exaggerated. A plano-convex or a meniscus lens may be used of about five inches focus, but the compound condenser, consisting of two lenses so curved as to give a brighter and flatter field, is far preferable, although more costly. The front or focussing may be either a quarter-plate portrait lens or a plano-convex lens of about four inches focus; or, still better, a pair of them, having the same equivalent focus.

The best form of lamp is the cup lamp, on the Argand principle; and the best oil, pure sperm, with gum camphor added as before advised. The best Florence oil is also very good for the purpose, adding the camphor as before.

Let me here seriously caution my readers not to use any explosive or mineral oil in paraffine or other lamps inside the lantern, as, from the great heat engendered, there is imminent danger of explosion. Common coal gas is all but useless, as it affords much less light than a good oil lamp.

114, High Street, Ilfracombe, Devon.

LAST WORDS OF SIR D. BREWSTER ON PHOTOGRAPHY.

THE following are the remarks written by the late Sir David Brewster, as a part of the address intended to have been delivered before the Edinburgh Royal Society, had illness not prevented:—

In most of our provincial towns there is a museum of natural history and antiquities, which would be a valuable auxiliary in teaching natural science in the neighbouring school. But even where no such collection exists, a small museum might be established in the humblest of our schools. Within their own narrow sphere objects of natural history might be obtained, and many a private collection in the district would surrender a tithe of its specimens for public use. Our Industrial Museum, too, might distribute a portion of its overflowing collections; and even the British Museum might contribute some of its innumerable duplicates, and bring into use its accumulated and unproductive treasures. Itinerant museums, like the itinerant libraries, might be chartered in the same cause, and might sell or exchange the duplicates which are found in different localities. By these means our school museums might obtain specimens of the more important rocks which form the carpentry of our globe, of the metallic ores, and the metals themselves which are in daily use, of the more precious minerals which are employed for the purposes of art or ornament, and thus give to the youthful student some knowledge of the world on which he resides, and of the elements of civilization which it embodies. In the departments of Zoology and Botany we cannot expect to collect specimens for our schools; but our travelling menageries and the museums and botanic gardens of our principal towns would supply, to a great extent, the means of instruction.

But even when these are beyond our reach, photography, and the stereoscope, which gives relief to its pictures, might be advantageously employed. The photographic process will give us accurate representations of those objects, both of nature and of art, which it would be desirable to describe and to explain in the instruction of youth. In the department of Zoology the picture might be often taken from the living animal, standing before the camera in vigorous life and transcendent beauty; or, when this cannot be done, from the fine specimens of zoological forms which adorn our metropolitan and provincial museums. With equal accuracy might be represented the osteology and integuments of animals, the framework which protects life, and to which life gives activity and power. The trees and plants, too, of distant zones will show themselves in true relief—the Banyan clinging with its hundred roots to the ground; the Bread-fruit tree, with its beneficent burden; or the deadly Upas, preparing its poison for the arrow of the savage or the point of the assassin. With no less interest will the school-boy gaze on the structures of the inorganic world—the minerals which have lain in the earth beneath his feet, the crystals which chemistry has conjured into being, displaying to him their geometric forms, infinite in variety, and interesting from their rarity and value. Painted by the very light which they reflect, he will see the Koh-i-noor and other diamonds, and the huge rubies and sapphires and emeralds which have adorned the chaplet of beauty and sparkled in the diadems of kings. The gigantic productions of the earth will appeal to him with equal power—the colossal granites which have travelled in chariots of ice, the precipices of ancient lava, the Doric colonnades of basalt, and the fossil giants of the primeval world, which trod the earth during its preparation for man, and have been embalmed in stone to instruct and to humble him. In acquiring a knowledge of physical geography, of the grander aspects of nature, their representations in relief will be peculiarly instructive. The mountain range, whether scarred with peaks or undulating in outline; the volcano ejecting its burning missiles; the fixed or the floating iceberg; the glacier and its moraines; and even the colossal wave, with its foaming crest, will be portrayed in all the grandeur of nature. The works of human hands, too, will stand before the scholar in their pristine solidity or their ruined grandeur; the monuments by which sovereigns and nations perpetuate their names; the pyramids (with their mysterious legacy to science), the gorgeous palaces of kings, the garish temples of superstition, and the bastions and strongholds of war will be seen as if the observer were placed at their base and warmed by the very sun which shines upon their walls. Although few of our village youth may

become sculptors, yet the sight of ancient statues, in actual relief, and in their real apparent magnitude, cannot fail to instruct and to refine them. To gaze upon the masterpieces of ancient art, standing in the very halls which they occupy, or to contemplate the *chefs-d'œuvre* of modern or living artists, with the sculptor himself standing by their side, must excite an interest of no ordinary kind. The works of the architect, the engineer, and the mechanist may also be exhibited in full relief at our schools—the gigantic aqueducts of ancient and modern times; the viaducts and bridges which span our valleys and our rivers; and the living machinery in our factories and workshops, which toil daily for our benefit, and supply the commerce of the world. With such means in our power, cheaply obtained and easily supplied, a large portion of scientific instruction may be instilled into the youth of our schools, familiarizing them with the works of their Maker, and preparing them for the reception of that higher revelation with which these truths of science cannot fail to harmonize.

FURTHER REMARKS UPON THE USE OF PERMANGANATE OF POTASH.

BY J. R. JOHNSON.

[The following is the communication forwarded to the last meeting of the Photographic Society by Mr. Johnson.]

Since I had the honour of calling attention to this subject at the last meeting of the Society, I have had further experience of the use of the permanganate, and have elicited some facts which are worthy of note, and which I will describe. Before doing so, however, I will make a few remarks with the view of removing some misapprehension as to the nature of the salt used.

It is not Condyl's fluid of which I recommend the use, but pure permanganate of potash, which may be obtained from any dealer in pure chemicals, in the state of definite-shaped crystals and of nearly absolute purity. These dissolve readily in about sixteen times their weight of water, forming a rich violet solution. A solution of about ten grains to the ounce will be found of convenient strength. On dropping this solution into the bath, the latter assumes a brilliant reddish-purple hue, which is due to the formation of permanganate of silver, if the bath be neutral; or to permanganic acid, if the bath be acidulated with nitric acid. Both these substances appear to act with equal power; but I strongly recommend that the acid be first neutralized, as there is then little doubt that the manganese from the deoxidized permanganate will be precipitated as the peroxide; whereas if nitric acid be present, a portion of this may be taken up in the presence of organic matter to form nitrate of manganese.

Only a small quantity of the permanganate solution should be added at one time. If it be added in too large a proportion, the permanganate of silver (which is sparingly soluble, requiring 109 times its weight of water for solution) is precipitated, and not only reduces the strength of the silver bath, but becomes useless, being carried out of the range of the substance to be oxidized. The colour which the bath first assumes changes gradually to a brownish olive hue, while the bath becomes turbid from the precipitated oxides. A further small quantity should then be added, and the reaction again watched, until completed. By this means the whole of the noxious ingredient, whatever it may prove to be, is removed, and the bath is made to work as clearly as before.

Care should be taken to leave no excess of the permanganate in the bath, as I find that it acts as a most powerful retarder or destroyer of the latent image, even when in small quantity. I believe that the same may also be said, to some extent, of the nitrate of manganese, for an acid bath appears to work more slowly after being acted upon by the permanganate, even when no excess of this salt has been left in the bath.

Fortunately we possess a very ready mode of eliminating all excess of permanganate, even if it should exist in considerable quantity. All that is necessary is to pass a solu-

tion containing it once or twice through a paper filter, when every trace of the salt is removed by the action of the cellulose of the paper reducing the permanganate. As the colour is a sufficient test of the presence of the salt, no difficulty exists in this respect. But for this facile method of separating the permanganate and detecting its presence, the process would be impracticable, as the retarding action of the permanganate is most energetic.

PHOTOGRAPHIC DIFFICULTIES OF AN AMATEUR IN SOUTH AFRICA.

BY DR. MANN.*

THE act to which I stand committed to-night, of appearing before the Photographic Society of London with an "Amateur's Difficulties," is a bold one, and stands in need of some apology. Indeed, I may as well make a clean breast of it from the beginning, and confess that the proceeding itself is the last and largest "difficulty" in my budget. It is only after some delay and consideration that I have ventured upon the course. I have but little to tell, and still less to show. But, on the other hand, I have much to ask. It is matter of familiar and general knowledge that the grandest and highest branches of human science are also the most liberal and cosmopolitan. The photographic societies of the world have done much to find for the pursuit that engages their attention a forward position among these high and liberal branches of human knowledge. It is not for me, in this presence, to say that the Photographic Society of London is in this particular not one whit behind the very best of its colleagues; but it is for me, in this presence, to say that I have designedly and discreetly put faith in this fact, and drawn upon the indulgence of an association devoted to the advancement of a liberal art, in laying aside my repugnance to appear with my small amateur dish at so distinguished and well-appointed a board.

In further deprecation of my proceeding, I should, perhaps, also add that, to my own mind, it seems well worthy of consideration that in the now somewhat large class of sorvitors who carry small dishes—namely, that of the so-called "amateurs" of scientific pursuits—there are many who are circumstanced like myself; that is to say, who have a deep and intelligent interest in the principles and progress of some branch of knowledge and art which has raised and compacted itself into a definite practice and profession, but who, on account of the exigencies and strain of other important demands upon their time, can only meddle with such matters at fitful, brief, and uncertain intervals, but who, nevertheless, can incidentally turn such an art as photography to most excellent account in carrying out investigations in other important fields. I have myself pretty well followed all that has been done in photography, as I have followed what has been done in physiology, in astronomy, and in other branches of research, on account of the intrinsic interest there necessarily is for the informed and intelligent mind in the knowledge itself. But I have practically dabbled with the processes of the art; I have qualified to carry my small dish, and write myself down "amateur," because I have desired at the least possible expenditure of time to be able to secure certain enduring records, notes, and suggestions of matters and objects that have come under investigation in a somewhat out-of-the-way field of research. Now, on looking back upon my labours and doings in this particular, I am of necessity painfully conscious that I have lost many records that I should have been but too glad to secure; and that I have wasted many valuable hours that I should certainly have turned to account, if I could have had either my present experience or better guidance at my start among the difficulties that I have to speak of. I am quite aware that there are amateurs who can and do achieve excellent results and marked success, even among such obstacles as I have had to flounder amidst. But I need not say such amateurs are of the "cream scientific of the earth." It is not for such men that the light of experience and the fetters of technical instruction are required; they move under the inherent force of the inspiration and fire that is within them. The light of experience and the fetters of instruction are required to enable less gifted and more ordinary mortals to accomplish useful, satisfactory, and steady work. I think it is now quite possible to apply the suggestion contained in these remarks to the marking out of a photographic process which shall be at

once convenient, handy, and sure for ordinary scientific travellers in remote countries and hot climates; and I fancy that my own experience has given me some inkling of the instrumentality by which this may be done. If ever again I return to the field where my own work has chiefly lain during the past ten years, I shall hope to do so in the possession of some such advantage. I am quite sure I shall be more likely to do so if I succeed in getting the members of the Photographic Society of London to realize what the precise difficulties are with which their amateur brethren have to contend in circumstances such as I am about to describe, and to consider the suggestions which I purpose to submit. Here, then, is the second argument which has contributed to bring me into the predicament in which I stand.

A third influence has also operated in over-ruling the natural instincts of my diffidence and modesty; and I am sure you will forgive me if I let you into the secret of this. Having recently returned to England, to which I am bound by very strong scientific and social sympathies, after an absence of some years, I am personally very glad indeed to avail myself of this pleasant opportunity and excuse to scrape an acquaintance with men so deserving of esteem as the photographers of England.

To pass on from apology to matter of fact: the great cause which underlies the difficulties the photographer has to deal with in Natal, the South-African land where my own experiences have been gleaned, is that it is a nearly tropical land, where molecular and chemical change are energetic and quick, and where actinism is capricious and slow. But this is not all. The season of summer, when the natural temperature is at the highest, is a season of frequent rain and superabundant moisture, when the air very closely resembles that of the hot-house conservatories at Kew; but when, also, as if that were not a sufficient photographic embarrassment, there occur at frequent intervals dry land-winds or siroccos that shrivel the leaves of trees and shrubs, and that crack the substance of wooden furniture by their parching touch. In the winter season, which is a period of moderate temperature and of almost unbroken sunshine, and when the perplexed photographer rejoices in the opportunity of getting out of the "frying-pan," he is unfortunately almost sure to find that he has only jumped "out of the frying-pan into the fire;" for at that season, when South-African nature has got rid of her superabundant dripping moisture, she perversely, and, I must add, most unfairly and inconsiderately, extemporizes a long period of "yellow calico." Throughout the dry winter the face of the country is more or less continuously covered with burning grass, and the sky is encumbered with a clinging and almost permanent veil of saffron smoke, which at times makes the photographer sigh for the chance of again getting back from the fire into his "frying-pan"—a "prison-house" photographical, whose "secrets" I now proceed to reveal.

There is one very important condition that underlies all "frying-pans," namely that of temperature, which now, in the first place, claims a few pointed words. The mean temperature of the year in Natal, at the height of 2,000 feet above the sea, is 64.7 degrees. On the coast the mean temperature of the year is a trifle above 69 degrees. The mean temperature of the six months of summer is 69 degrees, and the mean temperature of the six months of winter 60 degrees. The mean temperature of the several months varies from 55.2 degrees to 71.8 degrees. In winter the temperature of the day ordinarily rises above 70 degrees. In summer it commonly rises somewhere between 80 degrees and 86 degrees, and, when the dry land-wind is blowing, to somewhere between 86 degrees and 97 degrees. But high temperatures occur at all periods of the year. Thus, during a period of eight years I have recorded the temperatures of the air in the shade, hereafter named in each of the specified months of the year, namely:—

January	...	...	...	...	...	93.0
February	...	...	...	...	...	97.1
March	...	...	...	...	...	92.8
April	...	...	...	...	...	89.5
May	...	...	...	...	...	85.2
June	...	...	...	...	...	78.2
July	...	...	...	...	...	82.2
August	...	...	...	...	...	89.8
September	...	...	...	...	...	95.4
October	...	...	...	...	...	96.0
November	...	...	...	...	...	97.2
December	...	...	...	...	...	97.6

* Read before the London Photographic Society, March 10th, 1868.

I fear that very few of my present audience can altogether realize the pleasure of laying a collodion film in a tent under a blazing sunshine at these temperatures, as I have done, especially when the only sample at command has been a cadmium one, with an African ticket of naturalization of some twelve months' date.

Collodion is naturally the first substantive topic that rises to the surface as I proceed to tell my tale; and I think, in regard to it, I may at once and roundly state that the collodion, on the whole, I met the least trouble with, was the simply-iodized samples prepared by Mr. Thomas, of nine or ten years ago, which used to cover the glass with a thick yellow creamy film. I rarely had any other trouble with those samples than their getting slow of action after long keeping. They certainly were easier to work with—both on the ground of cleanness and of mechanical firmness—than any other kind that I have used. I was rarely troubled with stains of development with them in the most unmanageable temperatures, and I was never annoyed with the splitting and separation of films. After the introduction of the improvements in the manufacture of some eight years ago this was altogether changed. Every sample of collodion that then came to me was affected by the same perverse idiosyncrasy of being extremely difficult to lay after the bottle had been opened for a few hours, or perhaps days. In anything above the lowest temperatures it gelatinized in ridges before it could be got off the plate, even with the quickest handling; and this, as a rule, I found the radical defect of all the cadmium collodions in South African conditions and circumstances. I was at one time exceedingly delighted with some thin collodion of Mr. Hockiu's that I lit upon accidentally. It worked with great ease and pleasantness, and gave me plates with deep shadows and abundance of half-tone. But in every case this collodion covered itself with close reticulations after drying. Three, if not four, different tubes all gave the same result, both in my own hands and in those of a really able friend, acting independently. I have not a single plate left of many which were made with these collodions; the separation of collodion films from the glass, upon re-wetting for after-intensification or handling, is of very common occurrence. This, no doubt, is due to the positive impossibility of having the glass actually dry when the film is laid in the warm, almost saturated, atmospheres that have to be dealt with. Vapour is again settling on the glass the instant it is removed. Another very unpleasant form in which this influence, and probably in connection with it the inequality of drying (almost sure to be encountered under the circumstances) operates, is the sudden explosion of the film, some time after its complete drying, into a myriad of fragments. Some hours after the plate has been put by and considered all safe, cracks, like the fissures of starred glass, suddenly radiate in all directions, with a mischievous rustle. Of a very considerable number of studies of Katfir domestic architecture that I made upon one occasion, and that I valued for a special reason, all my best specimens have been destroyed from this cause.

I have no doubt whatever that long keeping of collodion in temperatures such as have to be braved in Natal does not answer. The mechanical texture of the collodion undergoes deterioration; and no amount of dilution with ether and alcohol to keep down the thickness of the liquid to convenient working density, can be relied upon on this account. In my own practice I always found the mechanical imperfections exasperated by extemporaneous additions of the solvent.

Here, then, comes the first point to which I desire to draw attention, and upon which I wish to seek counsel. I incline to think that the most satisfactory course that the amateur could adopt, in such external conditions as obtain in countries like Natal, would be to keep the pyroxyline in a dry state, and to have a good supply of the proper solvents constantly in store in small, well-closed receptacles, and so always to prepare just what collodion is likely to be required for each occasion some fourteen or twenty days before it is to be used. It would possibly be still better to prepare the pyroxyline itself from time to time; but this the amateur, who is otherwise pressed with occupation, will never do. It may be perhaps necessary that I should here again remark that it is solely from the amateur point of view that I am bringing forward my plea. I am speaking of men who, after weeks, or perhaps months, of forced abstinence from photographic pursuits, suddenly find some stray days, or some chance opportunity, when they can turn the art to account, and reap passing pleasure in its practice, if they have only the means at hand of doing so with fair certainty of working with-

out too great consumption of time, and with at least average success. The professional photographer can always arrange to have his collodions arriving from England at convenient intervals, and in a constant stream.

The nitrate of silver bath is far less troublesome in sub-tropical climates than the collodion; it is easily kept in fair working order; but there is one point in regard to it that may be worth a passing mention. My own practice was almost invariably to neutralize with freshly prepared oxide of silver, and then add as little nitric acid as I could work with. But I had a friend and companion in arms in Natal, who was naturally an exceedingly good manipulator, who used literally, when out on an excursion in the hot season, to pour nitric acid into his bath in an unmeasured stream, and who used continually to get good results in this way, whilst I was still floundering in streak and fog. My friend was originally my own pupil in the art, but he passed by his master at a very early period of the pleasant connection. From my own inability to get myself boldly and freely out of my earlier convictions and beliefs, I could never quite bring myself to follow the bold lead of my companion. But in illustration of the results of his heroic practice, I am able to submit to the Society some failures of my own by the side of successes of my friend, both produced at the same time and by the same materials, and in the presence of very unfavourable conditions of temperature—the only difference in the two cases being that I was painfully and obstinately trying to feel my way out of neutrality by the most cautious advance, while he was simply revelling in a nitric acid sea of unknown and unguessed depth. I am also able to submit at least one specimen of an instantaneous photograph made by this bold practice under the hot sunshine. In this illustration the curl of the breaking sea is clearly rendered.

(To be continued.)

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual Monthly Meeting of this Society was held in the City of London College on the evening of Thursday, March 12th, the Rev. F. F. STATHAM, M.A., F.G.S., in the chair.

The minutes of a previous meeting were read and confirmed.

No paper having been provided for the evening, the Question Box was examined, and of several questions introduced which had received the sanction of the Committee, one referring to the use of permanganate of potash for rectifying disordered nitrate baths was selected for consideration, and was, on the invitation of the Chairman, opened by

Mr. JOHNSON, who briefly related his experiences as already described in our columns. In his more recent experiences he had found it desirable that the bath should be neutralized before adding the permanganate. Care should also be taken not to have excess, for he found that permanganate present in the bath tended to retard the formation of the image, and so destroyed sensitiveness. He had also found that a 10-grain solution, as recommended by Mr. Simpson, was strong enough. The colour was an excellent test as to the proper quantity: if it were added a little at a time until the faintest trace of a pink tint remained in the bath, the effect would be produced, and this trace would be removed by contact with the organic matter furnished by the filtering-paper in the course of one or two filtrations. In reply to some questions, he said that the accumulations in old baths which caused fog were undoubtedly of an organic character. The alcohol and ether becoming oxidized by the iodine, nitric acid, &c., doubtless formed, as Mr. Simpson had suggested, aldehyde, which, having a reducing tendency, caused fog; and this body was removed by the action of the permanganate.

After some conversation, in which the Chairman, Mr. Pierco, Mr. Johnson, and others, took part,

Mr. WHARTON SIMPSON detailed the results of some experiments with the permanganate of potash (see p. 122 in our last).

In reply to some further questions, Mr. JOHNSON said that when the bath at once became brown and turbid without passing through the pink stage, it was clear that too much of the permanganate had been added. He thought that Condy's fluid should not be used, as it was often impure. If the permanganate

ate were added a little at a time, the whole of the alcohol and ether would be oxidized before any excess of permanganate would remain.

Mr. SIMPSON said it would be scarcely desirable to proceed to that point, inasmuch as alcohol and ether in their normal condition would not exercise any injurious effect, and their perfect oxidation would cause an accumulation of carbonate and acetate of potash in the bath. As it fortunately happened that the aldehyde formed by the decomposition of the alcohol, &c., which was the source of fogging, was acted upon and removed first by the permanganate, there was no need to add excess, which would tend to waste silver and injure sensitiveness. Any body which readily gave up oxygen would necessarily retard the formation and the development of the images.

Mr. SEBASTIAN DAVIS, after referring to the old method of testing water for organic matter, in which, after evaporation, the residue was burnt to ascertain the proportion of organic matter present, and pointing out the superiority of the present method, remarked that in order to examine the colour more perfectly it was customary to place the water to be tested in a tube two or three feet in length, in which the colour could be readily seen. He agreed with Mr. Simpson as to the retarding action of a permanganate, as it was a salt containing seven equivalents of oxygen, which it readily gave up; and the presence of such a salt during development, by peroxidizing the iron, would materially check its reducing action.

Mr. HART suggested, in order to avoid the risk of adding excess of permanganate, that a small portion of the bath might be taken, and, after precipitating the silver with a chloride, the permanganate might be added to the water cautiously until all organic matter was removed. By this means an estimate of the quantity required for the whole bath might be formed. He would like to know if Mr. Johnson had examined the precipitate to ascertain if nothing but sesquioxide of manganese was thrown down.

Mr. JOHNSON said the quantity of precipitate was so small that he had not attempted such an examination. He thought, however, that the reactions had been so fully stated by Mr. Crookes in the NEWS, that no doubt need be entertained on the subject.

After some desultory conversation, in which Mr. Hart suggested the importance of photographers publishing a record of their results with this remedy, and stated his thought that a portion of the silver would be thrown down as well as oxide of manganese,

Mr. SIMPSON stated that he believed not until excess had been added. The precipitate thrown down in the first case he had described, in which he used care to avoid excess, was of a different character to that thrown down when excess was added. The first was of a cold brown tint, the second of a purple brown tint, and, when examined, was found to contain permanganate of silver.

Mr. JOHNSON said that there could be little doubt that the safest and most efficient plan would be to use permanganate of silver, as suggested by Mr. Crookes.

Mr. BLANCHARD said that he had used Condé's fluid in one case to a bath, and had doubtless, although he used very little, added more than was necessary. A plate he tried was free from fog, but it was covered with fine needle-shaped crystals. On diluting and filtering, all this was removed, but still the bath worked a little slower.

Mr. JOHNSON again said that he thought it unwise to use Condé's fluid.

After some further conversation,

Mr. FOXLEE said that he had never had any difficulty in getting cleanness with doctored baths, but they never gave him so much sensitiveness as an undoctored bath.

Mr. SIMPSON said that in the bath he had tried the sensitiveness was greater after treatment than before. He believed that Mr. Blanchard had repeatedly found a corrected bath gave quicker results, as well as better, than he could obtain from an uncorrected bath.

Mr. BLANCHARD said that he often found that a bath treated with carbonate of soda and sunned gave him the highest sensitiveness and the highest quality.

Mr. FITCH confirmed this view.

Mr. FOXLEE said that his corrected baths were not slower than before correction, but slower than the new bath made with the purest fused nitrate of silver in the market.

After some further conversation, Mr. FOXLEE described a bath which sunning failed to improve, its fault being a ten-

dency to turning red in the shadows during intensifying. It was suggested that this defect would furnish matter for an evening's discussion.

The subject was then closed with a vote of thanks to Mr. Johnson.

The SECRETARY exhibited an old developed Talbotype, of which scarcely any trace was left. The print was cut up and divided amongst several members for experiments in revival.

Mr. SIMPSON exhibited a carbon print, produced in Berlin, by Swan's process, which appeared as the frontispiece to a German translation of his (Mr. Simpson's) work on Photography in Pigments.

The proceedings then terminated.

The next meeting, in April, will be devoted to examination and conversation upon photographs, which members are requested to bring for the purpose.

Correspondence.

PHOTOGRAPHY AND DISEASE.

SIR,—I think the question now being discussed in your columns, as to whether the practice of photography is unhealthy or not, must in a great degree be settled by the testimony of experience.

After sixteen years' handling and inhaling the deadly agents we use, I have had no symptoms of suffering from poison, and I am convinced that if the dictates of common sense were followed, no danger need be apprehended from their use; but if discretion is not used, we know that a man may lose his life by eating roast-beef and plum pudding. If prudence is necessary in the one case, it is surely doubly so in the other; otherwise the consequences will be the same.

During this period of my practice I do not pretend to say that I have not many a time been ailing with headache, and, I am not ashamed to say, "heartache" also. What with the overlearning which the progress of the art has rendered necessary, and the hard struggle to keep the "cart on the wheels" through the withering blast of unscrupulous competition, I have often wondered at my own endurance. I am sure, sir, that you will agree with me when I say that I feel it no small mercy to have come thus far out of the battle with unimpaired health and a comfortable prospect.

I have watched the course of many who prefer "gold to honour;" some have gained the prize; others, in their haste to be rich, have fallen, to rise no more. This hit-or-miss policy has of late come sadly to grief, for the good and honest reason that it has out-generalled itself; but for photographers proper there never has been a brighter prospect. Those who have striven to do their best for the art and their patrons have gained a position which is as essential in the science of trade as it is in the science of war.

Photography must always be a worrying and trying profession, but I believe that the worst is past, and that health and wealth are in store for the future.

W. HALL.

Brighton, March 17th, 1868.

THE USE OF DISTILLED WATER.

SIR,—The important question recently raised in your columns by Mr. Cherrill, as to the necessity of using distilled water in photography, although ably discussed by some of your correspondents as well as by the gentleman raising the question, has scarcely, I think, been set at rest. Mr. Cherrill himself tells us that he dispenses with distilled water; Mr. Russell Sedgwick, an old and experienced photographer, makes a similar statement. Statements of practice are always of considerable importance; but I should like to know the reason why of two or three points. In the first place, what constitutes "common water"? In the next place, presuming it to be, as I fancy it is, the ordinary water used for domestic purposes, does not this vary considerably in quality, according to the source from whence it is derived? And do not many samples contain chlorides, carbonates, sulphates, &c., as well as organic matter? If this be so, do we not run considerable risk of introducing contaminations into a new silver bath, which may subsequently cost us much trouble to get rid of?

I am a great advocate for simplicity wherever it can be obtained without paying too great a price. Will you enlighten

me on the subjects I have named, and also say what is the effect in a nitrate bath of having the impurities common in such a water as that of the New River Company?—Very respectfully yours,
AQUARIUS.

BLISTERS IN ALBUMINIZED PAPER.

DEAR SIR,—It is with much pleasure I read Mr. Bovey's paper on the all-important subject of photographic printing, and I am glad to find that he, by the opinions he has expressed, has confirmed mine, viz., that the cause of blistering of albuminized prints is most reasonably accounted for by imperfect coagulation of the albumen.

With thanks to Mr. Bovey and the journal in which he writes,—I am, yours &c.,
VESICULA.

March 14th, 1868.

Talk in the Studio.

INTERNATIONAL COPYRIGHT WITH AMERICA.—An International Copyright Bill has been laid before the American Parliament. It is to be hoped that it will include works of fine art as well as literature, in which case the provisions of the Fine Art Copyright Act of 1868, in which photographs are protected, may probably be comprehended in the new law.

THE CHEMICAL SOCIETY'S SOIREE.—On Wednesday evening, 11th inst., the President and Mrs. Warren De la Rue held a reception at Willis's Rooms, St. James's, which, notwithstanding the unfavourable state of the weather, was attended by a numerous and distinguished assembly, both of members and visitors, including many ladies. The exhibition of objects was varied and interesting. Many gems of art were displayed, in the shape of paintings by Guido, Gainsborough, and Turner; sculpture, Japanese porcelain, ivory carvings, and other articles of *vertu*. There were likewise a goodly selection of etchings by Hanhart, photographs and photo-lithographs from the Royal Arsenal at Woolwich, and others, illustrative of special novelties in the way of mechanical construction. A splendid series of new photo-enamel portraits was exhibited by M. F. Joubert. The phosphorescent figures of M. Gaiiffe—the butterflies, &c., lately described in this Journal—were exhibited by Messrs. Murray and Heath, who sent, also, some exquisite examples of stereo-photography. Mr. Thomas displayed his field tent in working order, and some beautiful samples of nitrate of silver, iodide of cadmium, and other photographic chemicals. Messrs. Hopkin and Williams showed specimens of alkaloids, a large bar of metallic thallium and several of its salts, also a fine sample of hyposulphite of lime in very large and perfectly formed crystals, suggestive of the applicability of this salt to photographic use. The aniline dyes were exhibited in the form of costly masses and large crystals by Mr. W. H. Perkin and by Messrs. Nicolson and Maule. The new chloride of silver battery, invented by Messrs. De la Rue and Müller, was shown in action, and gave a brilliant electric light between carbon points separated a quarter of an inch. A variety of optical instruments were exhibited by Messrs. Horne and Thornthwaite, Murray and Heath, W. Ladd, R. and J. Beek, and J. Browning. The last-named gentleman showed, in comparison with bleed, the spectrum of a newly discovered crimson colouring matter, containing copper, extracted by Mr. Church from the wing feathers of the Cape Lory. Several large blocks of Iceland spar, showing widely separated images by double refraction, were exhibited by Mr. Ladd; and in a room adjoining were arranged a fine display of Geissler tubes, an ozono generator, and the new magneto-electric machine, deriving its power from permanent magnets bent in a circular form. Beside Sir David Brewster's old illusion of the "cylindrical mirror," was shown by Mr. J. Huggins, photographer, of Norwich, a new polarizing kaleidoscope, in which the ever-changing coloured figures were produced by moving plates of agate, mica, and selenite. Messrs. Beek had prepared a surprise by bringing the microscope to bear upon the frontispiece plate—a photograph—in Mr. Barry's work on the Architecture of the Houses of Parliament, by which the initials of Mr. Pugin were clearly discernable in certain portions of the ornamental design.

QUEKETT SOIREE.—The Quekett Microscopical Club held a soiree in the laboratory and museum of University College

last Friday evening. Upwards of a thousand visitors were present, and a very magnificent collection of microscopes and various other forms of scientific apparatus was exhibited. Mr. Solomon illustrated the value of the magnesium light in illuminating enlarged images of microscopic objects. The evening was altogether a great success.

ART EXHIBITION IN LANCASHIRE.—An intended exhibition of works of fine art, to be held at Darwen, in Lancashire, is announced to be opened in May. As photographs will form an important feature of this exhibition, those of our readers who have pictures worthy of public display will do well to contribute to what appears likely to be an important and interesting local exhibition. Communications should be addressed, without delay, to W. S. Ashton, Esq., Hon. Sec., Darwen, Lancashire. The object is to provide funds for establishing an Educational Institution in Darwen.

SCIENTIFIC EDUCATION.—The Committee of Council of Education at South Kensington have recently passed a minute granting scholarships for the encouragement of scientific instruction.

TEST FOR THE PRESENCE OF A FREE ACID.—Dissolve chloride of silver in just sufficient ammonia to make a clear solution. If a little of the test be added to ordinary spring water, the carbonate acid present in the latter will neutralize the ammonia and precipitate the chloride. The above forms a good lecture experiment, the test being a very delicate one.—*Chemical News*.

TO PRODUCE ETCHINGS IN IMITATION OF THE OLD MASTERS.—A "Practical Man" sends the following, which has been described before, but is still little known:—"Take a quarter or one-third glass plate, coat it with any kind of collodion, and then put it into the nitrate bath; allow it to remain for three or four minutes, then take it out and well wash it; stand it up to dry; when it is so—or appears to be so—give it a further dry and warm before the fire or over a spirit lamp; then lay on the table and trace your design as you would on a copper-plate; then work away with the etching point or needle, removing the dry collodion dust with a duster or small bellows (no blowing with the mouth); when finished, print in the pressure-frame as you would a negative. For ornaments, cards, or artistic bits, good imitations of etching may be produced at the cost and outlay of a few pence."

To Correspondents.

PHOTOGRAPHY AND DISEASE.—A correspondent signing "Hypo (chondriac)" is disposed to have a good-natured laugh at those who attribute especially unhealthy influence to the chemicals used in photography, and seems to think that many of the symptoms described are traceable to ordinary causes. He says, speaking of his experience as an amateur:—"My symptoms were simply these. Once or twice in the course of last summer, after a day's outing with the camera, I have been visited by a most severe cold with all its attendant miseries; at another time with a violent attack of indigestion; and again, on one occasion, with a copious bleeding of the nose. Now I am fully persuaded that all these were but the effects of one or more of the chemicals—may be the collodion, may be the silver bath, or the hypo, which, either singly or combined, silently but surely invade the system. My matter-of-fact friends, to be sure, instead of giving me their sympathy for my martyrdom to the cause of science and art, would insist that the cold was but the consequence of my lying down on the damp grass after having worked myself up to fever heat in a broiling sun in the smallest of tents without a breath of ventilation; that my fit of indigestion simply arose from my having, at the end of a hard day's work, eaten too heartily after fasting since breakfast; and that, finally, the bleeding of the nose was due to nothing but my face coming into somewhat rude contact with the hand of a vulgar boor, whom I endeavoured to eject from my angle of view, persuasion having failed. But what can you expect from the ignorant, to whom our noble art is a dead letter? You, Mr. Editor, I am sure, will agree with me, that we must look for the true causes elsewhere, and that we must hold the collodion bottle responsible, until it has clearly proved its innocence, that that is the real culprit." As we pointed out in our comments on the first letters which reached us on this subject, many of the symptoms described by suffering correspondents are more legitimately attributable to inattention to ordinary hygienic laws than to the necessary influence of photography; but sufferers naturally enquire the cause of their sufferings, and nervous debility often depresses the invalid with "thick-coming fancies." We prefer to point

out, where we can, remedies for the suffering, rather than to laugh at the sufferers.

R. M. S.—The design and proportions of your proposed studio seem excellent. We should use common 21-ounce sheet glass unground. The process of grinding destroys the power of glass to transmit light in an enormous degree (in some cases as much as 60 per cent.), and, except when exposed to direct sunlight, its diffusing power is not required. We believe that a very pale and delicate cobalt blue glass has some advantages; but, on the whole, we prefer the common sheet glass, as least liable to change, and, being the cheapest, its occasional renewal, if it change colour, is not a serious matter. M. Salomon, as we have stated in the NEWS, with a glass room of a somewhat similar character to that you propose, has the whole of the skylight stippled to give the effect of ground glass. This can be done at any time in your proposed studio if you find it desirable to subdue the top light permanently. Mr. Blanchard's plan of using starch obstructs less light than grinding or stippling with white paint.

W. NORMAN.—The second you mention—that is, the London maker—undoubtedly.

JAMES CORNWALL.—We cannot explain the circumstances, but will endeavour to take occasion to enquire. The work is, however, so little and out of date that it would be of comparatively little use to you. There may possibly be another edition prepared at some time; but there has been no new one for many years.

EARNEST.—Your proposed alteration on the south side of your studio will probably be an improvement. The chief error in your lighting arrangements appears to be the management of the north side light. One imperative condition of good light is to employ the use of *one* dominant light, and not a series of distinct lights; the varied patches of light formed by 1, 2, 3, 4 on the north side cannot give satisfactory results. Let the whole of the side light from 1 to 4 consist of clear glass, using blinds on sliding rods to circumscribe the area of light when necessary. The best lighted pictures of those you enclose are B, F, and G.

H. E.—Your question is much too indefinite to enable us to give you definite information. The cheapest way to go to work to build a glass house depends on so many circumstances. Much depends upon whether you intend to use wood, bricks, or iron, in conjunction with glass, or which you will be permitted to use by the District Surveyor, should you be amenable to such an officer. A simple oblong building of ridge-roof or lean-to form of the size you mention, 20 feet by 8 feet, may be erected for from £30 to £100, depending on strength, finish, position, and other circumstances. You will find 8 feet rather too narrow; 10 or 12 would be better. Decide upon your general requirements, and then consult a builder; and, after deciding upon details, get a contract.

LIZZIE.—We cannot give Lizzie any very satisfactory information, we fear. Mr. Day, of 20, Cockspur Street, was, during last month, gazetted as a bankrupt. How the subscribers to the Art Union for the distribution of chromo-lithographs will fare, we cannot tell.

RHEUMATIC.—Your Ross's triplet will answer well for enlarging. 2. Its focus, so far as we remember, is 8 inches; in which case, in enlarging a card to 20 by 15, the distance between the lens and focussing screen would be about 56 inches. 3. A "common French lens" is scarcely likely to be suitable for enlargement, unless it chance to be a very good one. 4. Without knowing the focus we cannot state the distance required between the lens and focussing screen; probably between 40 and 50 inches.

TOMAHAWK.—Your flatted backgrounds must not be wetted before placing on a frame; by a little skill you may stretch the canvas pretty evenly. Attach the whole of one side with tacks first, then stretch gently and attach the other side, and so proceed. 2. "Flatting" consists of oil paint ground with turpentine and the smallest possible proportion of oil which can be employed; it is applied in the same way as oil paint, but requires some manipulatory skill to secure an even surface. Two persons effect it best; one applying the paint, and another following with a "softener" to blend the brush-marks.

BROMO.—We have not before met with such spots, but will give the matter our attention, and, if possible, trace the cause.

B. MAGIC.—The result you enclose is very promising. Experience alone will enable you to arrive at the best results in any new application of this kind. Possibly printing the image on glass, and then, when all the processes have been completed, transferring the film to wood, might answer, and prevent the surface of the wood becoming rough.

L. S.—In an English inch there are about 25 millimetres. A metre is 39 inches, a centimetre is one-hundredth part of a metre, and a millimetre one-thousandth part. About 2½ centimetres make an inch; and, of course, about 30 centimetres make a foot. We state the proportion in round numbers to avoid minute fractions. You will do well to familiarize yourself with the metrical system, which is that most commonly used in scientific statements of measure.

H. A.—Permanganate of potash may be used for removing organic

matter from printing baths, as well as negative baths. Mr. Johnson objects to Condry's fluid for the purpose as being often impure; in our own practice we have met with tolerably pure samples, and should not hesitate to use it when the permanganate in crystals was not readily accessible. 2. The fixing bath mentioned in the article to which you refer is exceedingly weak; weaker than we should recommend. The reason why a weak fixing bath is there thought sufficient is, we presume, that in the other part of the formula the solutions are weak; and the less silver salt in the paper, the weaker may be the bath in which the prints are fixed. When a sulphocyanide bath is used for toning, a somewhat weaker fixing bath may be used. 3. The experience of the gentleman who warns you against intensifying with pyro and silver preceded by iodine, and recommends bichloride of mercury as giving a more stable negative, is exceptional, and we cannot advise you to accept his advice. We have not found any deterioration in negatives intensified in the first-mentioned manner.

W. J. A. G.—Mr. Claudet did make a lens of topaz; but did not, we believe, get the diamond lens made, as he intended, had he lived. Prints from a negative taken with the topaz lens will be presented to the members of the Photographic Society. 2. The lens you mention, if it work well, is undoubtedly cheap at the money. You must bear in mind, however, that the whole-plate lenses of French opticians are rarely larger in diameter or longer in focus than the half-plate lenses of English opticians.

J. W. H. A.—Oil cloth or kamptulicon is best for the floor of a studio, because they may be easily kept clean and free from dust. Carpet or cocoa-nut matting may be used, but require more care to prevent the occasional annoyance of dust. The colour of the matting would not be too light, unless a strong top light fall upon it.

M. WANE.—We regret that we cannot give you definite information as to the period of receiving contributions at the Leeds Exhibition.

TOP-LIGHT.—We should suppose that the defect to which you refer—namely, the faces being flat and white, and the drapery too dark—was due to slight under-exposure. The white calico diffuses the light throughout the rooms, but prevents direct light reaching the model.

D. S. (Aberdeen).—The decision as to the method of enlarging much depends on the results desired, and the appliances and skill you possess. If you wish to enlarge small negatives, up to (say) 12 by 10, then the process upon collodion and transferring is good. If you wish for more extended enlargements, the production of enlarged negatives, or the use of the solar camera for producing enlargements on paper will be better. In all such matters it is impossible to say that any special method is the best, as each is qualified by circumstances, and each photographer must determine for himself. Try the enlargement on collodion, and then transfer; this is simple, and requires but little apparatus beyond what all photographers possess. 2. If you succeed well with the acetate bath, do not change. We described the sulphocyanide bath as giving special results suited to special circumstances, but not as preferable for general use to the acetate bath. We prefer the acetate to the phosphate. 3. We do not think that the small miniatures you mention will ever become a rage, and they could scarcely be of much importance commercially if they were. We cannot write private letters in answer to photographic queries: our time is too fully engaged.

W. H.—A properly finished Daguerreotype does not fade; but it may become obscured by tarnish by exposure to the atmosphere. This tarnish may be removed by cyanide. First wet the plate and see that the water flows freely over it; sometimes alcohol is necessary to secure this; then, when the water flows without appearance of greasiness, apply a 10-grain solution of cyanide, which will quickly remove the tarnish; wash well, finishing with distilled water, and dry off with a spirit lamp. This is an operation best performed by a person familiar with Daguerreotype manipulation.

W. J. L.—We fear that we have no correspondent at Vienna to whom we can address such enquiries, but will see if opportunity serve.

R. H. COURTENAY.—Thanks.

J. L.—The exposure of 90 minutes with a wet plate in landscape photography to which you refer is, of course, absurd; the statement is doubtless an error of the writer, who has a very imperfect knowledge of such matters. 2. All the paragraphs you name are unacknowledged extracts from our own columns. 3. Probably very speedily.

HENRY SPINK.—We presume that transfer paper can be obtained of dealers in lithographic materials, such firms as that of Hughes and Kimber, for instance. Your letter in our next.

B. B. L.—There are occasionally other injurious sulphur compounds in cards besides hypo. We shall have something to say upon the subject shortly.

Several Correspondents in our next.

Several articles in type are again compelled to stand over.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 499.—March 27, 1868.

CONTENTS.

	PAGE
Sel Clement, or Preservative Nitrate of Silver	145
Dry Plates without Preservative	146
Critical Notices	146
Ventilation of Dark Rooms.....	148
Gn Collodio-Bromide. By W. B. Bolton	149
Pictorial Effect in Photography. By H. P. Robinson.....	150
Researches on Dry Plates. By M. Carey Lea	151

	PAGE
Photographic Difficulties of an Amateur in South Africa. By Dr. Mann	132
Correspondence—"Lux Graphicus" on the Wing—Gas or Oil Lamps for the Magic Lantern—Preliminary Coating of Albumen in the Wet Process—Some Experiments with Baths	154
Talk in the Studio	155
To Correspondents	156
Photographs Registered	156

SEL CLEMENT, OR PRESERVATIVE NITRATE OF SILVER.

WE noticed some short time ago the introduction of a new salt of silver under the name of "Sel Clement Preservative Nitrate of Silver," intended for use in printing. Besides being offered at a price not exceeding three-fourths of that of pure nitrate of silver, it was stated to possess certain specific advantages over that salt, especially in the fact that paper prepared with it would keep sensitive for some time without deterioration. In estimating the economy of any new preparation offered in place of the ordinary salts of silver there is one conclusion at which we must inevitably arrive; namely, that half-a-crown's worth of the new salt cannot possibly contain more than half-a-crown's worth of silver; but as it is by no means impossible that this silver may be in combination with other bodies which aid the production of good results with the consumption of a small amount of silver, it cannot be asserted, without experiment, that a new salt is not economical. It is certain, therefore, that a novelty promising desirable results is worthy of trial.

We examined a sample placed in our hands, and ascertained that it contained nitrate of magnesia as well as nitrate of silver, which fact we announced. We then placed a portion of the salt in the hands of a distinguished chemist, who is a member of our staff, for careful quantitative analysis. From his report we learnt that the salts of silver and magnesia appeared to have been mixed in about equal proportions. Feeling that it would be unfair to the manufacturer to make known the results of an analysis of his preparation before it had been fairly tested by the public, who might be prejudiced by a statement that less than one half of the new salt consisted of nitrate of silver, we forbore, for the time, to publish the details of our examination, resolving to test the salt in practice, and also to learn the result of other experience before making further comment on the subject.

A contemporary has, however, relieved us of the necessity for further reticence by having published an analysis, from which it would appear that the example under examination contained only about one-third of its weight of nitrate of silver. It may be fair to the manufacturer and of interest to our readers that we should publish the result of our analysis, which is somewhat more favourable to the purchaser than that of our contemporary. We give it in the form we received it from our analyst a couple of months ago. It is as follows:—

"The *Sel Clement* submitted for examination is a mixture of salts, somewhat moist, white in colour, deliquescent, and very fusible. Reaction to litmus paper slightly acid. It consists of—

Nitrate of silver	46
Nitrate of magnesia	33
Water	21

100

"The salt contains a trace of iron, but no nitrate of soda, saltpetre, or zinc salt. It is impossible to drive off the water by fusion without decomposing some of the nitrate of magnesia, which then becomes partly insoluble in water.

"The nitrate of magnesia bears no definite atomic relation to the nitrate of silver, its amount standing between one and two atoms to one equivalent of the silver salt."

Our sample, it will be seen, contained 46 per cent. of silver, whilst that of our contemporary is only stated at 34.5 per cent.

A somewhat singular circumstance remains to be stated. Dr. Phipson, the English correspondent of the *Moniteur de la Photographie*, mentions in his letter the fact that the salt which had been recently introduced into this country contained nitrate of magnesia, and makes some comments thereon. The inventor of the *Sel Clement*, of whom the Editor speaks as a chemist of well-known reputation, writes a long letter to that journal, complaining of what he considers an unfair criticism of his invention by the English correspondent. With reference to the statement that the new salt of silver is nothing more than a mixture of nitrate of silver with nitrate of magnesia the inventor refuses to enter into a discussion as to whether these two salts combined exert a more beneficial effect than the silver salt alone, but states that, besides the salts just named, the *Sel Clement* contains two other substances which are organic, of which one is combined with the silver in the form of a salt, and is slightly sensitive to light, while the other possesses the preservative principle, and preserves the whiteness of the paper. "What are these two substances?" asks the inventor. "Seeing that they are organic bodies, it will be difficult to discover their nature by means of chemical analysis, and they can only be detected either by chance or by researches continued in a certain direction." After some discussion of the question of novelty, in which he states his conviction that the nitrate of magnesia had never "been suggested, except for the preservation of sensitive collodion, and not for paper," he proceeds to defend his right to keep the constituents of his material secret, at any rate, until he has indemnified himself for his labours. He does not pretend to any grand discovery, or seek to obtain honour and glory from his invention; he states that he merely asks for an impartial trial of a material which possesses certain special advantages; and if the salt fulfils the expectations of the buyer, he is fully content. He concludes by deprecating the tendency of the photographic world to consider any newly introduced material which is brought under the notice of the public as nothing better than quackery, and refers to the respectability of his agents as testifying to the genuineness and soundness of his product.

The question of the inventor as to the other constituents of his salt assuming the form of a challenge, we felt deserved a reply, and having discovered no indications of organic

matter in the sample in our possession, we consulted the gentleman of our staff to whom we have already referred, as to any indication of an organic compound in the sample submitted for his examination. Here is his reply:—

"MY DEAR SIR,—The sample of *Sel Clement* received from you on 1st February does not contain a trace of any organic substance. I prove it in this way:—All organic matters contain carbon, and give rise to the production of carbonic acid upon being fused with nitrate of silver. Quarter of an ounce of the *Sel Clement* was introduced into a test tube, fitted with a cork and small delivery tube, heated to fusion, and maintained for a considerable time in that state. The reddish vapours and all evolved gases were conducted into lime water contained in another test-tube. Not a trace of carbonic acid came over, for no precipitate made its appearance in the lime water.

"In order to ensure the existence of proper conditions under this negative experimental result, a small particle of sugar (less than one grain) was introduced into the apparatus, the cork replaced, and the fusion of the *Sel Clement* continued, when ample evidence of the production of carbonic acid was obtained by the immediate formation of a precipitate in the lime water.

"In affirming that *Sel Clement* does not contain organic matter, I would go further, and say that, even if organic matter were added in the course of preparation, it could not long survive the action of the boiling liquid at the time of evaporation. Again, if the crystals of *Sel Clement* really contained organic matter—such as sugar, citric acid, or other preservatives—in admixture, they would be alterable by exposure to sunlight, which is certainly not the case in that in my possession.—I am, dear sir, yours, &c.,

"March 18th, 1868."

"THE ANALYST."

All questions of the constitution of the salt apart, however, we think that the impartial trial for which the introducer asks should be fairly accorded to it. Our own experiments have not been sufficiently extended for a definite opinion; but we may remark that a 30-grain solution certainly gave better results than a 15-grain solution of nitrate of silver, and showed no tendency to dissolve the albumen. The paper so prepared also kept well; but it was somewhat less sensitive, and gave less vigour than a 30-grain nitrate solution containing sugar. The salts afford strong evidence of the value of nitrates—such as those of soda, ammonia, potash, or magnesia—when added to the nitrate bath, and so confirms the experience of many practical men, which has been contemned by a few theorists.

It may be worth while to mention that nitrate of magnesia was proposed as a preservative as early as 1854 by Messrs. Spiller and Crookes, for use not only with collodion plates, but also for use in paper, in conjunction with nitrate of silver in the Talbotype process.

DRY PLATES WITHOUT PRESERVATIVE.

The use of dry collodion plates without any preservative has been often proposed, and although tried from time to time with some degree of success, from some uncertainty as to the conditions upon which this success depends, the process has never been extensively adopted. To those who have experimented in this direction it has been tolerably clear that the quality of the collodion materially influences the results. One sample of collodion, simply washed and dried after exciting, will yield a clean, bright negative; whilst another, treated in all respects in the same manner, yields a thin, fogged, imperfect image; yet both samples have worked well in the wet process.

At the last meeting of the French Photographic Society M. Romain-Talbot detailed the manipulations necessary with a collodion prepared by M. Harnecker, in which the plate is simply thoroughly washed and dried after exciting. The nature of the collodion is not stated, but it seems probable that it consists in the addition to the collodion of some trace

of an organic substance capable of combining with silver, or that the collodion is prepared from a sample of pyroxyline in which a trace of nitro-glucose has been formed in the process of manufacture. The prints exhibited to the meeting were from negatives produced on plates which had been kept for six months, thus indicating excellent keeping qualities. The formulae and manipulations given by M. Romain-Talbot for employment with this collodion are as follows:—

Preparation of the Plates.—Clean the glass with care, collodionise in the usual manner, and, when the last drop of it has nearly evaporated, plunge it for four or five minutes into a bath composed as follows, keeping the plate in motion:—

Nitrate of silver	...	...	15 grammes
Distilled water	...	...	150 "
Pure nitric acid	...	...	1 drop.

This bath, it will be seen, contains nearly fifty grains of nitrate of silver to the ounce, and possesses an unusually large proportion of nitric acid, which renders it probable that a large proportion of a bromide is employed in the collodion.

When the plate is taken out of the bath, allow it to drain; wash it with distilled water; wash further with ordinary water, and finally with filtered or distilled water. If the plate be not well washed there is risk of a bad negative; good washing is, therefore, an essential condition; and should the water be of a calcareous nature, it is recommended to use distilled water only. Dry at a temperature of about 90° Fah. Thus prepared, the plate will keep during many months.

Exposure.—Twice or three times as long as the wet plate.

Development.—Plunge the exposed plate for from five to ten minutes into a bath of distilled water, and from thence into the silver bath above described, plunging the plate in and out four or five times; and then develop with a solution composed of—

Sulphate of iron	...	...	75 grammes
Water	...	...	1,800 "
Glacial acetic acid	...	...	45 "
Absolute alcohol	...	...	60 "

When all the details are well out, wash well and continue to develop with a solution of—

Pyrogallie acid	...	...	1 gramme
Distilled water	...	...	225 grammes
Glacial acetic acid	...	...	10 "

To which is added—

Nitrate of silver	...	...	1 gramme
Distilled water	...	...	48 grammes
Glacial acetic acid	...	...	1 gramme.

Continue with the last solution until the negative shall have acquired the strength desired.

Fixing Bath.—

Hyposulphite of soda	...	...	1 gramme
Water	...	...	3 grammes.

Finally, coat with a dilute solution of gum, and dry the plate.

Critical Notices.

PHOTOGRAPHIC OPTICS: including the Description of Lenses and Enlarging Apparatus. By D. VAN MONCKNOVEN, Doctor of Science. With Five Plates and Eighty-seven Woodcuts. Translated from the French. (London: Robert Hardwicke.)

It is a true remark, which has been oft repeated of late, that in photography the progress of practice has continually outstripped that of theory. Processes have been long practised with skill, and attended with success, the rationale

of which is still but imperfectly understood. What is true in the chemistry of photography is true in relation to its optics. We do not mean to assert that opticians have worked by rule-of-thumb rather than by mathematical knowledge, although that position might possibly, in some degree, be justified; but we mean that many photographers have acquired some knowledge of the use of lenses, and of the application of special lenses to special purposes, without the slightest knowledge of their construction or of the reason why a lens excellent for one purpose failed in another, or of the principles upon which their selection of lenses for various uses should be based. Dr. Van Monckhoven believes, —and, we fear, with much reason—that the knowledge of how to use a lens is “a thing about which ninety-nine photographers out of a hundred are in ignorance,” and adds, that “to use a lens improperly is to produce portraits false in perspective, buildings and houses falling into the street,” &c. It is tolerably certain that more ignorance prevails in regard to the optics of photography, even amongst cultivated photographers, than in regard to any other of the multifarious branches of knowledge requisite to constitute a really good photographer, and that any work which may aid to dispel that ignorance should be hailed with welcome by the photographic community.

Dr. Van Monckhoven's treatise on photographic optics was issued in French about two years ago, and is now introduced by Mr. Hardwicke to photographers in an English dress. No translator's or editor's name is appended to the work; but, with the exception of the insertion, in one instance, of a foot-note by the Editor, attempting, but erroneously, to correct the author, the work seems very well done.

We need scarcely remark that the task of producing a work on optics for photographers was an exceedingly difficult one. It was necessary to preserve scientific accuracy, and it was not less necessary to deal with the subject in a popular manner; and in attempting both, the work ran the risk of being pronounced superficial by scholars, and abstruse by the unlearned. Nevertheless, without sacrificing precision—some few doubtful positions excepted—Dr. Van Monckhoven has endeavoured to write a popular book, and has produced an addition to the text-books of the art which every photographer ought to possess.

The work is divided into two books: the first treating of optics and lenses, as applying to the ordinary practice of photography; and the second of the apparatus and processes employed in enlarging.

The early chapters of the first part are devoted to a statement of the known laws of light and of optics generally, treated with especial relation to photography, and furnishes a succinct account of the history, quality, and construction of the various lenses now in use. The various aberrations—spherical aberration, chromatic aberration, curvature of field, distortion, and astigmatism—are carefully considered, in connection with their causes and cure, and the relative degree in which they each prevail in different kinds of lenses, the copious use of diagrams tending materially to aid the student in a perfect understanding of the author. After treating fully of the aberrations of lenses, the author proceeds to the classification of lenses under two distinct heads, the *aplanatic* and the *non-aplanatic*, the former giving sharp images over a small field with their entire aperture, and the latter, requiring stopping down, giving sharp images over a more extended field. It is in the treatment of this part of his subject that the author lays himself most open to the charge of shackling himself with theories the truth of which is not borne out in practice. Many of the new lenses which have been introduced of late, and which he classifies as non-aplanatic, he utterly condemns as a retrograde rather than an advancing step in photographic optics. All single combinations come under this sweeping condemnation, as well as some other lenses which possess a high popularity amongst photographers. The reason alleged is as follows:—

The practice of photography has established that, when the

image at the focus of a lens is wanting in intensity, the photographic reproduction of this image is itself wanting in relief, the foregrounds being too black, the objects situated in the horizon confounded with the sky, and the clouds in the sky replaced by a plain ground of uniform tint; the proof, in a word, is wanting in aerial perspective, and, if it be a portrait, in vigour and relief. For, to give sharp images, non-aplanatic objectives require very small diaphragms, and generally of from $\frac{f}{40}$ to $\frac{f}{72}$, f being

their focal length: hence an insufficient intensity in the image and the defect which we have just pointed out. But, exempt from distortion, and including a considerable angle, they are useful in some special cases, such as the reproduction of cartes, buildings situated at a very short distance, or landscapes and buildings strongly illuminated by a powerful sun.

Aplanatic objectives, under the head of which rank the *triplet*, include a less angle, but do not require diaphragms exceeding $\frac{f}{30}$; and therefore they give more artistic photographic

proofs, in which the foregrounds and the horizons are well brought out, and the skies have clouds. If the light is insufficient, they are employed with a larger diaphragm; and the sharpness of the image is not destroyed as with non-aplanatic objectives, but only limited to a smaller field. They can be used for portraits in the open air, groups, and animated scenes, with their entire aperture—an advantage which is invaluable in practice. Lastly, the angle they include, being between 50 and 60 degrees, is more than sufficient, because, if this angle is more considerable, the effect of the perspective is doubtless more astonishing than agreeable.

In our opinion, therefore, the use of non-aplanatic objectives—such as the *single lens*, the *globe lens*, Mr. Ross's *doublet*, and that of *M. de Steinheil*—should be abandoned (except in some special cases, which we have enumerated above) for that of aplanatic objectives, among which the *triplet* is the best, as being free from distortion.

Whilst fully endorsing the author's views as to the excellence of the triple, we take exception to his wholesale condemnation of many of the lenses the abandonment of which he recommends. For landscape purposes, many of our best practical photographers prefer the use of a good ordinary single lens; the wide-angle-single lens, and the rapid stereoscopic single lens of Dallmeyer, are justly regarded as amongst the most useful instruments placed in the hands of photographers; and the reputation of the doublet of Ross is justified by the numerous admirable photographs produced by it, and brought from time to time under the attention of photographers. The author's position, so far as it is confined to a recommendation to the use of lenses giving good definition with wide apertures, we most cordially support, and agree with him that lenses requiring small stops to secure definition should be abandoned, as, besides the protracted exposure involved, the pictures produced are flat, tame, and unsatisfactory. It is only to his sweeping condemnation of all lenses alike which come within his theoretical classification as non-aplanatic that we take exception.

But whilst strongly expressing his leaning, on theoretical grounds, to the lenses he classes as aplanatic, the author is strictly fair and just in his description and treatment of the various lenses in detail, dealing with the subject in a spirit of scientific impartiality which is highly commendable.

The practical portions of the book will be read by photographers with the greatest interest. Here is an example relating to a subject to which the attention of photographers has of late years been much directed, but which is by no means yet exhausted:—

Depth of Focus.—Depth of focus is the property of lenses of giving a clear image in planes of which the distance is unequal. It follows from this that the ground-glass placed at the focus of a lens may be moved to a very slight extent without the image sensibly losing its sharpness.

To prove this experimentally, bring a camera furnished with a single combination to bear on a landscape. Bring to a focus the objects farthest off. We shall soon remark two things: the first is, that the ground glass can be advanced or withdrawn to a small extent without the sharpness of the image of a fixed plane of the landscape sensibly changing; the second is, that if we bring to a focus the most distant plane, many other nearer planes will still be in focus.

The same experiment can be made with an opera-glass, which may be regulated for distant objects so as that they may be seen

very distinctly. If you now direct the glass to nearer objects you will also see them with perfect clearness. Similarly, by holding the opera-glass directed on a distant object, you will see that you can move the eye-piece a short distance without lessening sensibly the sharpness of the image by doing so.

It is to be observed that the depth of the focus varies with the

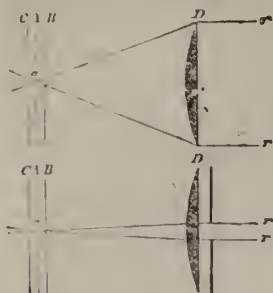


FIG. 44.

FIG. 45.

aperture of the lens. Figures 44 and 45 make this very plain. In figure 44 we make use of a lens with its entire aperture. The rays, r, r , emanating from a distant point, form, after having traversed the lens D , the image of the point at a on a screen or ground glass A . But if the ground glass be either drawn back or advanced, to C or to B , for example, the image of the point immediately spreads out in a circle, because angle a is very large. When the same lens, D (fig. 45), is reduced to its central part by a stop, the image of the point is still formed at a , but the ground glass can be placed at C or at B , without the image of the point becoming now appreciably altered. This is because, in fig. 44, the rays, r, r , emerging from the lens, are much more convergent than in fig. 45.

It results, therefore, from the preceding, that a convergent lens is capable of giving a sharp image of planes distant from each other, contrary, apparently, to the law of conjugate foci. But experiment shows that it is only on the condition that these planes are sufficiently distant from the lens that their image may be formed near the principal focus. Thus, the nearer objects approach the lens, the less becomes this depth of focus, as is shown by the following short table, which gives the focal lengths of a lens of 10 cent. focus, for objects of which the distance is constantly diminishing:—

Distance of object.	Elongation of focal length of the lens.
10,000 metres	0.001 millimetres
1,000 "	0.01 "
100 "	0.1 "
50 "	0.2 "
10 "	1.01 "
5 "	2.04 "
4 "	2.6 "
3 "	3.5 "
2 "	5.3 "
1 "	11.1 "
50 centimetres	25 "
40 "	33.3 "
30 "	50 "
20 "	100 "

This table is very instructive. It enables us to see clearly that for objects 50 metres distant, for example, the focal length of the lens is increased only two-tenths of a millimetre, a length quite inappreciable; for 10,000 metres it is increased still less, only a thousandth of a millimetre. Therefore, all objects situated more than 50 metres from the lens will be in focus on the ground glass, however great may be their distance.

When, on the contrary, the object is situated very near the lens—for example, 30 centimetres from it—the ground glass has to be drawn out 5 centimetres; when at 50 centimetres, the glass has to be drawn out 2½ centimetres; when the object is distant one metre, the glass has to be drawn out 11 millimetres—quantities relatively great. For this reason, objects situated at a short distance from the lens give sharp images only on the condition that they are very near each other; hence the difficulty of obtaining the image equally sharp if this condition is not fulfilled.

Thus, then, the depth of focus of the lens varies with its aperture and the distance of the objects which form the image at its focus. It varies, also, according to the form of the lens or the optical combination of lenses composing an objective. Convergent meniscus lenses have the greatest depth of focus when their concave face is towards the objects. Among objectives composed of several lenses, the *orthoscopic* has the greatest depth of focus, and the ordinary *double combination* the least. This is because the former has generally a small aperture in relation to its focal length, and because, moreover, the divergent lens placed along with the anterior convergent lens renders the emergent pencils less convergent. The second, on the contrary, has generally a very large aperture, and besides, the rays emergent from the first lens (the one which is towards the object) are rendered still more convergent by the second lens.

After giving a full description of the various forms of photographic lenses in use, the mode of using photographic lenses receives attention, after which the author proceeds to

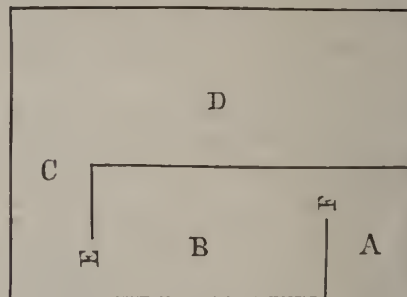
the subject of enlargement, a subject he has pre-eminently made his own, and demonstrated by the production of some of the finest enlargements which have ever been brought before the public. In this part of the book the processes and modes of working receive attention as well as the apparatus to be employed, and much valuable information is conveyed to which we shall probably return on a future occasion.

In the meantime, we remark that the work is one which every photographer ought to possess and study, and that the photographic world is deeply indebted to Dr. Van Monckhoven for the production of such work, and to Mr. Hardwicke the publisher for presenting it to English readers in an admirably neat and perfect form.

VENTILATION OF DARK ROOMS.

MR. CHAS. WAGER HULL, in the *Philadelphia Photographer*, commenting on Mr. Cherrill's plan for ventilating dark rooms given in our last volume, says:—

"On reading and examining it, I was convinced that the plan alluded to of curing the evil would add another to the long list of the photographer's troubles, which, though it might save his health in one way, would injure it in another by spoiling much of his work, make him mad, ruffle his temper, cause him to say 'naughty words,' and generally be productive of bad consequences. If we are to have ventilation in our dark rooms, it is well for us to have not only good wholesome air, but, as well, air not charged with dust, which would be the case if introduced, as is proposed, in the article referred to, and which most certainly would be the case if brought in from out of doors. Imagine a current of air passing into our operating-room in midsummer, when everything is dry, and all the lighter particles go floating about through space, in entire disregard of eyes, nose, ears, or as, in this instance, dark rooms.



"By the introduction of this air into the dark room, I claim that though the physical health of the operator might be benefited, his moral health would be injured, his work would be spoiled; therefore, of the two evils, choose the least, of which choice there can be no doubt. 'How shall we better this plan?' the reader may be asking. Very easily, and thus: Do away with the door of your dark room, and, in its place, build up a crooked sort of an entrance, as seen in the ent following.

"By this simple plan all light is cut off from the entrance, and the room is as well ventilated as need be, without the troubles which are certain to come from the plan first alluded to.

"You enter at A, and, turning to the left, pass through B, and enter at C into the dark room D. By this simple arrangement you do away with the door, the constant opening and closing of which raises, during a busy day's work, enough dust to produce pinholes *ad libitum*.

"To my knowledge, several rooms built after this plan are an unqualified success. If any reader imagines that the light can possibly get into his room (which I do not), then let him make his passage B wide enough to put a partition

half-way across said passage as seen at E and F, and paint the inside of an orange or yellow colour. Should light enough to do injury get in after this addition, then blame the writer."

ON COLLODIO-BROMIDE.

BY W. B. BOLTON.

In opening this subject, I do so more in the hope of inducing others to try collodio-bromide than with the intention of introducing anything new; for though much still remains to be done before the process will be perfect, so much has already been accomplished that in the present state of photographic knowledge there is, I fear, little chance of any considerable improvement being made either in this or other processes; and until new materials are utilized, or new methods of applying the old ones discovered, we must be content to take things as they are. At the same time there is no reason why we should incur unnecessary trouble in any of our operations when the means are at hand of dispensing with that trouble; and it is certainly bad policy to occupy the whole of a fine summer's evening pent up in a stifling dark room, with the temperature almost at fever heat, preparing half-a-dozen or a dozen dry plates for next day's use, when the same may be easily and comfortably finished in half an hour, and equally good results expected.

The one advantage which collodio-bromide has over all other dry-plate processes is the extreme simplicity of all its operations; and the saving of time and trouble is a matter of the greatest importance, especially to those who have not much leisure to devote to photography. Amateurs, as a rule, belong to this latter class, and to them, therefore, it offers peculiar advantages. If a person takes up photography as a recreation, his aim should be to make it as much like enjoyment and as little like work as possible; instead of which some seem to try the very opposite plan. What would be thought of a man who, of his own free will, spent his leisure time in stone-breaking, that is supposing him not to be a geologist? or of another, who had a passion for voluntary exercise on the treadmill? There are many, I know, who do both under compulsion, but they are not to be considered as amateurs.

Most of my readers have, at any rate, a slight acquaintance with collodio-bromide, and do not, therefore, require to be told that it consists of collodion holding bromide of silver in suspension. The idea of dispensing with the use of the bath by using a collodion containing the sensitive silver salts is, I believe, very old, collodion containing iodide of silver having been used several years ago, and almost simultaneously with the publication of the collodio-bromide process in 1864; then Liesegang published his experiments with a similar process, based upon the formation of iodide of silver in the collodion, but found it unsuitable for negative work; indeed, it was not until bromide was substituted for iodide that any success was obtained. For some time it seemed doubtful whether the process would ever become popular, and up to last year its use was confined almost entirely to a few Liverpool photographers; but now, thanks to the exertions of Mr. Mawdsley, it has been so practically worked out as to bear comparison with any of the standard dry-plate processes of the day. And now to proceed to details.

We will commence with the collodion, as being the most essential part of the process. Though scarcely so dependent upon the collodion as most other dry processes, there are still certain requirements to be fulfilled if any degree of success is to be attained. The most important thing to be looked to is the age of the collodion; before it is of any use it should possess that quality, or combination of qualities, generally termed "ripeness." The length of time required to ripen it, of course, depends upon the bromizing salts. I have found very little difference in the results obtained by different formulæ, provided always the collodion was of the requisite age; I do not care how old it is, as long as it is old enough.

The formula I generally work with is 6 grains of bromide of ammonium and 4 to 5 grains of pyroxyline to the ounce of collodion, the ether and alcohol in equal parts. This requires no more than two or three weeks to put it into working order. Mr. Mawdsley's formula I do not know exactly, but bromide of cadmium is the prevailing feature. My reason for preferring the bromide of ammonium to that of cadmium is the peculiar effect the latter salt has in rendering the collodion glutinous, which effect is only partially removed by age. It is of the utmost importance that the collodion should be as structureless as possible, for the horrors of a mottled or crapy collodion are doubly magnified in the collodio-bromide process. It is a well-known fact that if the ether predominate over the alcohol, the collodion will give a strong film, but very much inclined to mottling and crappiness; an excess of alcohol, on the other hand, gives an open structureless film, more liable to break away in the operations of washing and developing, and also more sensitive. I consider it a mistake, therefore, to use the ether in excess, but would rather incline to the opposite course, the only objection being the difficulty of keeping the film on the plate, which is easily obviated by the use of a substratum of albumen or india-rubber. The former I prefer, as there is no bath to contaminate, and it does its work much more effectually than india-rubber, and the trouble is so very small that it need scarcely be taken into account.

With regard to the salts used in the collodion I may, perhaps, say a word or two. Cadmium and ammonium are at present the only ones used, but I see no reason why the list should not be extended to two or three more, the bromides of lithium and magnesium amongst the number. The latter, which is a very unstable salt, rendering the collodion very limpid and structureless, might with advantage be used to counteract the opposite qualities of bromide of cadmium.

The quantity of silver used in sensitizing the collodion will, of course, vary according to the formula, in consequence of the difference in the atomic weights of various bases. A collodion containing 8 grains of bromide of cadmium, which may be taken as the standard quantity, would require, according to theory, exactly 10 grains of nitrate of silver to combine with its bromine; but in practice it is found necessary to use a little more. With bromide of ammonium, of which the atomic weight is less, 6 grains would be about equivalent to 8 of cadmium, the exact theoretical quantity of silver required being 10.4 grains. The bromides of lithium and magnesium being still lower in the scale, would combine with the same quantity of silver in the proportion of 5.1 grains and 5.4 grains respectively.

The silver having been added, the next question is how long the collodio-bromide should be kept before use, and how long it will keep in a fit state for use. There are so many opinions on this subject that it is a difficult question to answer, most agreeing, however, that the sooner it is used the better. I find it to be in its most sensitive state about six hours after it is mixed, and I also find it impossible to do anything much with it when more than a few days old.

If the collodion be properly made, no substratum will be required; the edges, of course, must be tipped with india-rubber or albumen, but as a security against accidents it is better to take a little extra trouble and use the substratum. A number of plates may be coated and packed away in a dry place until required for use.

Everything ready, my plates "tipped" or albuminized as the case may be, my mode of procedure is as follows:—Having first filtered the collodio-bromide lightly through cotton-wool, I coat the first plate. More care is required in coating a plate with collodio-bromide than with ordinary collodion; if the surplus be run back into the bottle too quickly, a streaky film is the result. The first plate is then laid down to set whilst the second is coated; number one is then transferred to a dish of clean rain-water, and number three coated, and so on, until the required number are

coated. I allow each plate to set for about a minute. When all the plates are coated and placed in water, I commence at the first one again, and put them through the tannin, on to the draining-rack, and then dry them.

If no more than a dozen plates are to be prepared, only one lot of washing water will be required, but for a larger number it will be safer to change it occasionally, lest the silver should collect to an injurious extent. When dry, the back of the glass is coated with annatto, and the plate is then ready for exposure.

For developing, the only solutions required are:—

No. 1.			
Strong liquid ammonia	...	...	1 drachm
Water	...	...	7 drachms
No. 2.			
Bromide of potassium	...	...	8 grains
Water	...	...	1 ounce
No. 3.			
Pyrogallie acid	...	...	100 grains
Pure alcohol	...	...	1 ounce

A mixture of alcohol and water may be kept also for moistening the plates before development. The first step is to remove the annatto, which is easily effected with a damp sponge or cloth; for this purpose it will be found convenient to have a frame of wood into which the plate can be laid face downwards so as to avoid touching the film.

The annatto removed, the plate is then covered with alcohol and water, and washed thoroughly. Then take a small quantity of water according to the size of the plate, and to each drachm add one drop each of Nos. 1, 2, and 3, which will, if the exposure have been rightly timed, bring out the picture very quickly. When all the detail is out, wash and apply another dose of developer containing two drops of Nos. 1, 2, 3, to each drachm. Should the second application not confer sufficient density, wash, and apply a third dose of the same strength as the last. Fix with hypo, and finish in the usual way.

That bromide alone is superior to iodide and bromide mixed, for dry plates, I think nobody will now deny. Its rapidity, its power in rendering detail in foliage or badly lighted subjects, and, above all, the improved method of development to which it is adapted, deserve the attention of every dry plate worker.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAOSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER IX.

"It is sometimes admitted that the mere imitation of nature is not sufficient to make a picture, and that some art in the treatment is required, but nevertheless contended that students should confine themselves to the imitation, without any reference to the pictorial effect. But it will require a strong argument to support the position that amateurs should be limited to that portion which requires incessant application, and debarred from those licenses to make their productions agreeable which are freely admitted in the works of professed artists. Moreover, it is difficult to discover why the end should not always, and from the first, be kept in view.—Howard.

In making a pictorial representation of a scene from nature there are many particulars worth bearing in mind, some of which are self-evident, but which, for the sake of order, and for the information of those who have not arrived at even the elementary stage of art, may be as well mentioned here.

Parallel lines are objectionable. If the horizon is bounded by a straight line, the middle distance or foreground should be undulating. This is often easily managed by a change of position so as to get a perspective view of the foreground. A move of a few yards will often entirely alter the lines of a picture.

A front elevation of an object is seldom so picturesque as the same object seen in perspective. Figure 1 is from a stereoscopic slide, slightly exaggerated for the sake of making the defective composition more glaring. The parallel lines

of the towers are at right angles with the parallel lines of the river, and the alder bush occupies a prominent position in the centre: an arrangement than which nothing could be worse. A position taken forty or fifty yards along the bank



Fig. 1.



Fig. 2.

of the river would present a view as represented in figure 2, which entirely agrees with the rules of composition as set down in former chapters. Some writers argue that, because the artist is not greater than the Divine Maker of nature, he should make no attempt to improve or select nature. Now, photographs taken from either of the stand-points indicated by these sketches would be equally true, but figure 1 is probably the way in which these writers would represent the castle, and figure 2 is how the same object would be presented by an artist. I leave my readers to select which they would prefer.

However objectionable straight lines may appear when many of them run parallel with one another, a few straight lines are exceedingly valuable in a landscape, giving variety by opposing the more graceful curves, and presenting a feeling of stability in the picture. Sometimes a few parallel lines in the distance and sky afford a pleasing contrast to the undulating lines in the landscape. A small portion of straight line is often of extreme value in a picture containing many curves. The lines of a building on an eminence, or seen through trees, always add to the picturesque effect. In the interior of a cathedral or church the straight lines of the columns many times repeated give an idea of stability and solemnity to be obtained by no other way.

If a picture were divided down the middle, one half should never be a facsimile of the other. For instance, if a photograph were taken of the nave of a church from the centre of the aisle this effect would be produced. The repetition of the receding pillars produces grandeur, but the exact repetition of the same pillars on the opposite side would produce monotony. The same observations will hold good in a great variety of instances. A representation of a view extending down an avenue of trees, down a river, or down a street, as in figures 3 and 4, should never, if it is possible to avoid it, be taken from the centre. On a comparison of figures 3 and 4 the difference of result will be seen at a glance. The



Fig. 3.



Fig. 4.

awkward effect of placing leading objects, such as the figure, cart, and church in figure 3, one above the other in a line, will also be apparent.

A picture should also always be properly closed in. The centre of an arch should never be left without any other support than the side of the picture, as in figure 5; but if no more of the landscape can be included the picture should finish at the abutment of one of the piers of the bridge.

No doubt the imagination of the spectator will supply the missing abutment or support, but it is very much better to show it in the picture. The same remark also applies to arches in interiors.



Fig. 5.

The choice of the position of the horizon is often a matter for serious consideration, but it may be taken as a rule that it should never be equi-distant from the top and bottom of the picture; that is, the plane should not be equally divided between earth and sky. The exact position—whether the horizon is above or below the centre—must be determined by the subject; but I have noticed that the majority of photographs seem to demand that the greatest space should be devoted to the earth; while, on the other hand, the majority of paintings and drawings have the horizon low. This difference may probably be accounted for by the fact that hitherto the sky has been a difficulty with photographers: first, because their endeavour has been to produce photographs so cheap that they could not afford to print in skies from a second negative; and secondly, because, although here is very little mechanical or chemical difficulty in the production of natural clouds when they exist, it is very rarely that a fine and suitable sky is found behind a landscape. It is scarcely probable that many persons, even of the timider sort, are deterred from introducing sky effects into their pictures by the objections of those who, to give some appearance of weight to their arguments, quote Ruskin, or, worse, feebly imitate him, failing, however, to catch his spirit or convey his meaning.

This subject is so important that I shall devote a future chapter to its consideration.

RESEARCHES ON DRY PLATES.

BY M. CAREY LEA.*

The investigations described in the previous papers have been continued at great length, and the effects of a great number of substances upon the "collodio-bromide" mixture have been studied. To attempt anything like a description of the results of each of these sets of experiments would take up too much space. Many scores—I might say hundreds—of plates were exposed, and it was found that a surprisingly large proportion of the substances tried, not merely conferred sensitiveness, but often a high degree of it. Of all these trials, which have cost very much time and labour, it is proposed here to give only the useful results. These were, first, the fixing of certain principles affecting all collodio-bromide work more definitely than heretofore understood; and, secondly, the discovery of two dry processes of a new character, and which leave little to be desired in facility, sensitiveness, and excellence of result. I speak of them as two processes; they are, however, but variations the one of the other, giving, however, very different results, adapted to different conditions. These processes are, in every way, so satisfactory, that I expect, in my own case, to use them henceforth exclusively.

GENERAL OBSERVATIONS ON THE COLLODIO-BROMIDE PROCESS.

I have made a very large number of comparative trials of collodio-bromide plates, prepared in very many different ways, having taken great pains as to uniformity of exposure, selecting uniform light, timing accurately, and developing

the plates alongside of each other in pans filled with alkaline developer, which had been mixed in quantity and then poured into the separate pans, thus ensuring an exact uniformity of treatment, a precaution especially necessary in the comparative examination of dry plates, where differences in the plates and in their exposure may be so largely compensated by managing the development.

It has seemed to follow, from the results obtained, that the highest degree of comparative sensitiveness to weak light requires that the sensitizer employed should act on the film in the presence of free nitrate of silver; that is, a process in which the sensitizer has been applied in the presence of free nitrate of silver will give better detail in the shadows when the high lights have received just their proper exposure, than a process in which the plate has been washed previously to receiving the organic sensitizer. Consequently, softness will always be promoted by adopting a system in which the organic sensitizer has acted in the presence of free nitrate. Contrast and brilliancy will be promoted by first removing the free nitrate.

Whether this principle extends to other forms of the dry process besides the collodio-bromide I shall not now inquire; but I remark that, in the only dry process that has been regularly adopted and carried out on a large scale for the protection of negatives commercially, this principle of placing the sensitizer in contact with free nitrate of silver finds a place. I allude to that form of the collodio-albumen process used by Mr. England. I say this, not by any means as advocating the exclusive use of plates prepared under such conditions, but as affirming that, where the object is to secure softness, it is best attained in that way.

Another point to which my attention has been directed is the nature of the changes which a collodion salted with bromides only undergoes after the addition of nitrate of silver. It has been observed that when the nitrate of silver in fine powder is first shaken up with the bromized collodion, the latter, if poured on glass, is bluish and transparent. After a time it is found to have changed its character, and gives on glass a creamy and much more opaque film. Nitrate of silver dissolves very slowly in collodion, and the opinion has been, if I am not mistaken, that the change from the blue to the creamy condition marks the point at which enough silver salt had dissolved to saturate the bromide, and have an excess of silver present in the collodion.

This is very far from being the true explanation. A collodion may have a large excess of silver present in solution, and yet exhibit the blue condition. Conversely, it may give actual excess of bromide, and yet be creamy. In my opinion, the creamy condition results from an action of the bromide of silver upon the collodion itself. The following are the conditions under which it takes place:—

The creamy condition appears after an interval, which depends upon the temperature and upon the proportion of nitrate of silver in excess. The higher the temperature of the room the sooner it comes; and it comes faster in proportion to the excess of nitrate of silver up to a certain point; but if a very large excess of nitrate (relatively) is present, it comes very slowly, or not at all. Thus, when the collodion above described was sensitized with 20 grains of nitrate of silver to the ounce, representing an excess of $6\frac{1}{2}$ grains, no indications of creaminess were visible after eighteen hours standing in a room with fire in it. One cause of this is, evidently, that where there is so much nitrate of silver present, the bromide of silver will not remain in suspension. For when the bromide of cadmium or other soluble bromide is in excess, the bromide of silver, as is well known, shows little tendency to precipitate, but remains for a very long time suspended. When the nitrate is in small excess, there is already much more tendency to precipitate; and when as much as 20 grains is added to a collodion of 8 grains bromide of cadmium and 2 grains bromide of ammonium, the bromide of silver settles, to a large proportion, within a few hours.

A curious fact is, that when the collodion has once passed

* Philadelphia Photographer.

into the creamy stage it has very little tendency to return to the blue; so that, if more collodion be added in such proportion as to leave a small excess of bromide, the creamy condition still continues. I have had collodion in which there was one grain of nitrate of silver less than sufficient to saturate the bromide, and which was perfectly creamy.

These considerations are of no small importance in making dry plates of any sort by the collodio-bromide process; for the conditions of success are, that the film shall contain from 1 to $2\frac{1}{2}$ grains of excess of nitrate of silver. Some have directed to use no excess of silver-salt, but to get the mixture as nearly neutralized as possible. I am satisfied that this is a mistake, and that the cleanest and brightest picture and most sensitive films are got with 2 or $2\frac{1}{2}$ grains excess of nitrate. The creamy condition is also essential. Plates tried with even $6\frac{1}{2}$ grains excess of nitrate and bluish films were very insensitive, and no good results could be developed on them.

(To be continued.)

PHOTOGRAPHIC DIFFICULTIES OF AN AMATEUR IN SOUTH AFRICA.

BY DR. MANN.*

It will make a brief, and possibly not unamusing episode, if I give another instance of the dash and boldness of my heroic pupil and friend. Upon one occasion we planned a visit to a wild district some thirty or forty miles beyond the then frontier of the colony, and still further beyond the houses of civilized men. We arranged that we would take some photographic apparatus with our pots and pans and everyday camp necessities; and in a fit of sublime resolution my friend resolved that he would work with no less pretentious an instrument than a whole-plate camera that he had recently imported from England. In order, however, that we might place ourselves beyond the reach of accident, we had two of the steadiest of our Kafir attendants told off, to be devoted exclusively to the charge of two of the most delicate of our impedimenta. One man carried, strapped over his shoulder, my mountain barometer, which on another occasion I had successfully and safely conveyed all round the colony in my travelling waggon. The second attendant bore over his back a large full plate glass bath, in the usual mahogany watertight case, filled with a precious fresh solution of the nitrate that we had prepared with the most consummate and careful skill for the occasion. At the end of our second day's march I found my mountain-barometer unpleasantly minus its mercury, which cost the instrument a six months' voyage to England and back for a new tube before it could be used in any service scientific again. I never learned what the process was by which my black friend had managed so soon to get his glass siphon emptied of its contents; but I have no doubt in my mind that the proximate cause of the result was the urgency of the caution which had been given him. He had been told that whenever he took the case off his shoulder he must never lay it down, but stand at ease, with his charge upright, one end upon the ground, until he was relieved of it by some duly qualified and accredited hand. In all probability, in making sure that he carried out his instructions in their full spirit as well as letter, he had struck the end of his case firmly down into the ground, to make doubly sure that it should not fall! In dealing with these amusing people, it is never possible to be altogether prepared for the grotesque and perverted views they take of the meaning and relations of the implements of white men. I once had a Kafir lad in my service who could not be brought to believe that the kitchen dustpan was not especially provided to cook his breakfast in.

To pass on, however, from the barometer to the bath. On the third day of our outward journey, when I was just recovering from the vexation the irreparable loss of my barometer had occasioned me, I was jogging along upon my horse chatting with my friend, our waggons and straggling cavalcade within easy reach behind us, when we heard a sudden outcry a little way behind; and on riding back to investigate its meaning, we found our bath-bearer struck motionless with fright, his burthen hanging from a stick over his shoulder, but the nitrate of silver solution running freely in streams down the lower

part of the blue striped shirt which constituted his livery. On relieving him from his load, we found the glass bath inside the mahogany case in three pieces, and the last drops of the precious solution just loitering amidst the fragments. The distress of the poor fellow at finding his back double-dyed with sable, as the sun, with its well-known impartiality, actinized the sensitized film of his cuticle, was one of the most ridiculous scenes that can well be conceived. At first we punished the unknown delinquency of our attendant by telling him the stain was of necessity ineradicable. But the effect of this punishment upon the member of a race which believes everything of this kind to have some "witchcraft" application was so severe that I was obliged to pledge my chiefly word that I would charm the stain away, so that no trace of it could be discovered, either naturally or supernaturally. A small stock of cyanide of potassium in the waggon enabled me to fulfil my pledge.

I must now confess that if the campaign had been entirely in my own hands after the destruction of our bath, I should have succumbed under the evil, and abandoned at once all photographic aspirations for that occasion. My friend, however, took the view that the pursuit of knowledge under difficulties is, in the end, quite as pleasant, and in some sense more profitable than walking the beaten road. We accordingly took stock of our appliances. We found that we had a small supply of dry nitrate of silver in our repertory, and, by an exhaustive overhaul of our camp equipage, we discovered that we had an enamelled iron dish in the kitchen department that had not more than half a dozen holes through the outer enamel. These we carefully repaired by a coating of sealing-wax. We next bent the largest pin we could find into a crook, and coated that too. We were free from all anxiety of strain in the matter of distilled water, for we had now learned that all the water in this part of south Africa is distilled. There is no trace of lime-salts in the greater portion of the country; and the frequent rain flows rapidly down through hard rocks of granite, slate, and sandstones, in so pure a condition that the natural stream can be turned to any use in photographic work. It is rare to find even the slightest perceptible trace of cloud on adding nitrate of silver to the liquid. For some years I took the trouble of distilling water for baths, developing solutions, and first washings, but for some considerable time have fallen back upon the merely settled and filtered water of the surface streams for everything, without discovering the slightest inconvenience. The large full plates we of course had to abandon, as your kitchen forecasts had never contemplated camp-stews of that dimension. But, by great good fortune, we had with us a small binocular stereographic camera; and with this and our enamelled dish and crooked pin, we worked throughout the expedition. I lay before the Society a series of the results of our practice, which, bad as they may be if judged by the high canons of photographic excellence, are interesting as records of the objects and scenes we encountered, and quite good enough to justify my heroic friend in his dogma that photography under difficulty, and in an iron dish, is better than no photography at all.

There is very little to say on the theme of development, excepting that the sulphate of iron developer, of medium strength (that is, comprising about 20 grains of the iron salt to the ounce of water) is the most pleasant to work with. It is of course necessary to give somewhat more than ordinary care to the manipulation of this part of the process, because the collodion film is almost always repellent of the solution, and unaccommodating to a troublesome degree, and abnormal deposit and reduction occur, in the high temperatures that have to be encountered, like a flash.

The gelatino-iron developer works most admirably, and is uniformly pleasant and reliable. I found Mr. Hughes's simple plan of dissolving a few grains of gelatino in the ordinary solution of the sulphate of iron serve every desirable end. I submit two or three small photographs produced with this developer at very high, and what would otherwise have been very unmanageable, temperatures. On account of the rapidity with which the undesired reduction takes place, it is unquestionably best to give full exposure to the plate, and to have as little to do with subsequent processes of intensification as may be. A weak solution of pyrogallol acid, with subsequent infinitesimal additions of nitrate of silver, is, I think, all that should ever be required.

Dry-plate photography is, beyond all question, eminently adapted to the circumstances that I have described as obtain

* Continued from p. 141.

ing in lands situated like Natal. The plates keep excellently, can be carried about and played with even at the most unfavourable seasons, and may be developed days after their exposure. I have had dry plates, prepared in England after Hill Norris's plan, sent out, and have used them after I have had them months on hand, and very rarely experienced a failure. The best method of handling them, in my experience, was to give them full exposure, and then develop with a weak solution of gallic acid, until all detail was faintly apparent. The alkaline development is perfectly manageable, but, I think, not, on the whole, so satisfactory as the gentler treatment after full exposure. I submit pictures made from dried plates, prepared in England, and used months subsequently in South Africa. The exposure in these cases was twenty minutes in full sunshine. Both the albumen and tannin processes worked well. I preferred the tannin process as being the least troublesome; and I have no doubt that if I had used it more frequently, and made myself more familiar with its handling, I should have had little difficulty in getting very fair results. Liability to harshness and patchiness in the skies was the principal fault that occurred to me in my working; but this, I am quite satisfied, was due to my own want of care, and most probably of skill, in manipulating, and would be quite obviated with an extended experience.

If I return to my old haunts, I shall certainly fall back extensively upon Mr. England's simplification of the collodio-albumen process, and upon Mr. Bartholomew's acetate of morphine process, employing the one when requiring plates for three or four weeks' keeping, and the other when able to prepare the plates twenty-four or forty-eight hours before using them. I have not yet actually used either of these processes; but I am quite certain, from their description and the experience I have had with dry processes, that both would prove most valuable, pleasant, and certain methods of working in the conditions and circumstances I have named.

But there are obviously urgent reasons why dry-plate photography, even in its best and most sensitive forms, cannot be altogether relied upon to furnish all that the amateur requires during a lengthened sojourn amidst objects of interest in tropical or sub-tropical countries; and this remark at length brings me to the threshold of what I design to be the main point of this communication. Pending the fulfilment of Mr. McLachlan's promise, which, of course, I intend, in common with the rest of the photographic world, to avail myself of when the consummation is complete, I now incline to a direction of working which, if there be no concealed and latent objection not yet perceived, gives fair promise. I think, of turning the flank of the greater part of the difficulties that have to be braved. Upon a recent occasion I spent a few hours with my old friend Professor Piazza Smyth, of the Royal Observatory of Edinburgh; and on making a comparison of notes, he told me that for months he had struggled, both at Tenerife and in Egypt, with the same legion of troubles that I have described, and that he had finally only escaped from them by changing his own strategy. He then very kindly illustrated his entire process, and showed me a large series of results that he had achieved. Professor Smyth states roundly that, in his own old plan of working, he could never command, in high temperatures, anything like certainty of result; whereas, with his new plan of working he never fails. After a deliberate and careful examination of his plates taken in and around the Pyramids, and a subsequent review of all the circumstances of my own Natal experience, I have quite come to the conclusion that, in any future campaign I may have the opportunity of entering upon, I shall supplement dry-plate procedure with some modification of Professor Smyth's method of wet-plate manipulation.

The members of the Photographic Society are no doubt aware that Professor Smyth's recent process consists mainly in employing a small camera that can be carried about in the pocket to make Lilliputian negatives on glass, which are exposed to the lens of the camera while resting quietly in the sensitising bath, and which are subsequently enlarged at convenient and favourable opportunity to any size that may be required. The advantages which are incidental to, and, indeed, inseparable from, this mode of procedure, where such temperatures and capricious moisture and dryness as I have endeavoured to describe are concerned, are so obvious that it would be impertinent to dwell upon them in this presence. The extreme portability of the entire series of apparatus required, the precision and certainty with which the exposure can be managed, the shortness of time, and the entire absence of all irregular

and partial drying of the film, in the first place, before the actinic influence is brought to bear upon its sensitive surface, and, in the second place, before the latent image is developed by the reducing agent, will suggest themselves on the instant. Professor Smyth works transversely upon the strips of glass prepared for the reception of microscopic objects, the negative picture so produced being just one inch square. Under this management stains are altogether unknown to him, and he can command clear brilliant pictures at all times and under all circumstances. The miniature pictures are so exquisite in detail that they do not suffer in the least when enlarged to the size of plates of the ordinary dimensions. It would be superfluous here to remark how important it is to the scientific traveller to be able to, secure, by this ingenious proceeding, an almost endless number of miniature negatives which are capable of being compactly stored in the little boxes prepared for the preservation of microscopic slides, and which can be turned to account by enlarged copying on subsequent opportunities when the exigencies of travel are past.

I should, perhaps, here add that my own inclination at present is not to work quite so small as Professor Smyth does, but to adopt as a standard for bath exposure the largest plate that proves to be consistent with easy manipulation and facility of transport.

There is, perhaps, only one other offender who requires to have his name entered in this record of photographic plagues. His name is Varnish! I have found very few samples indeed, either of amber and chloroform varnish, or of hard spirit varnish, that I could depend upon for printing under the South African sun. Nearly all prove tacky and adhesive under the heating power of the direct solar rays. Here, again, I do not doubt that much of the evil depends upon the very great difficulty of having either the sensitized paper or the printing-frames themselves absolutely dry in the atmosphere that has to be dealt with. I have lost a considerable number of plates that I should have been glad to retain, from adhesion of the paper to the varnished surface in the printing-frames. The only certain means I have found of obviating this evil has been to print only in diffused light. I adopted this practice resolutely and exclusively during my last month's sojourn in Natal; and I can but regret that I did not do so sooner.

I trust that it will now be apparent what the course of proceeding is that I incline to adopt in any future need of my own and to recommend to amateurs in warm regions, whose object in occasional and somewhat uncertain and capricious meddlings with the actual processes of photography is scientific and incidental, rather than artistic and direct.

1. I propose to use dry-plate manipulation for out-of-door work as extensively as possible, adopting some such process as the acetate of morphia plan whenever the plates can be used within a reasonably short period of their preparation, but falling back upon either Mr. England's modification of the collodio-albumen, or possibly upon Mr. Gordon's gum process, where a journey is on hand, and longer time is required. It will be remarked that, in selecting these processes, I am mainly influenced by the consideration that all materials required for them are such as can be easily kept always on hand in a fit state for use in a capricious atmosphere of high temperature and uncertain moisture.

2. I propose to prepare the collodion employed, at comparatively short intervals, in small quantities, by dissolving the dry pyroxyline in the appropriate solvents preserved in small, well-closed receptacles.

3. And, finally, I propose, wherever more sensitive plates and quicker action are required, to use chiefly small plates with a miniature camera, which allows the exposure to be made while the plate is still immersed in the sensitizing bath. It has recently occurred to me that, in all probability, the subsequent enlargements of these small negatives might be very pleasantly and satisfactorily effected upon the best forms of dry plates, either by the use of diffused solar light under a sufficient exposure, or by the adoption of Mr. Solomon's plan of employing the magnesium light.

The gentlemen of the Photographic Society of London will confer a great boon upon a large class of their amateur associates who are working in remote lands under circumstances of special "difficulty," if they will consider these propositions, and determine how far they are likely to prove sound and reliable in the conditions which I have described, and in what way it may be possible either to modify or to extend them with advantage.

Correspondence.

"LUX GRAPHICUS" ON THE WING.

DEAR MR. EDITOR,—I have often troubled you with some of my ideas and opinions concerning the progress and status of photography, and you have pretty often transferred the same to the columns of the PHOTOGRAPHIC NEWS, and troubled your readers in much the same manner. This time, however, I am going to tell you a secret—a family secret. They are always more curious, interesting, and important than other secrets, state secrets and Mr. McLachlan's photographic secret not excepted. But to my subject: "The Secret." Well, Dear Mr. Editor, you know that my vocations have been rather arduous for some time past, and I feel that a little relaxation from pressing cares and anxieties would be a great boon to me. You know, also, that I am a great lover of nature, almost a stickler for it to the exclusion of *prejudicial art*. And now that the spring has come and winter has fled on the wings of the field-fares and woodcocks—that's Thomas Hood's sentiment made reasonable—I fain would leave the pent-up city, where the colour of the sky can seldom be seen for the veil of yellow smoke which so constantly obscures it, and betake myself to the country, and inhale the fresh breezes of early spring; gladden my heart and eyes with a sight of the bright blue sky, the glistening snowdrops and glowing yellow crocuses, and regale my ears and soul with the rich notes of the thrush and blackbird, and the earliest song of the lark at the gates of heaven.

It is a pleasant thing to be able to shake off the mud and gloom of a winter's sojourn in a town, in the bright, fresh fields of the country, and bathe your fevered and cateebled body in the cool airs of spring, as they come gushing down from the hills or across the rippling lake or dancing sea. I always had such a keen relish for the country at all seasons of the year, it is often a matter of wonder to me that I ever could bring my mind to the necessity of living in a town. But bread-and-butter do not grow in hedgerows, though "bread and cheese" do; still the latter will not support animal life of a higher order than grub or caterpillars. "There's the rub." The mind is, after all, the slave of the body; for the mind must bend to the requirements of the body; and as a man cannot live by gazing at a "colt's foot," and if he have no appetite for horseflesh, he is obliged to succumb to his fate, and abide in a dingy, foggy, slushy, and bewildering world of mud, bricks, and mortar, instead of revelling in the bright fields, fresh air, and gushing melodies which God created for man, and gave man senses to enjoy his glorious works.

But, Mr. Editor, I am mentally wandering among "cowslips," daisies, buttercups, and wild strawberry blossoms, and forgetting the stern necessity of confining my observations to a subject coming reasonably within the range of a class journal which you so ably conduct; but it is pardonable and advantageous to allow mind to run before matter sometimes, for the latter is more frequently inert than the former, and when the mind has gone *a-head* the body is sure to follow. Melancholy instances of that prescient themselves to our notice too frequently. For example, when a poor lady's or gentlemen's wits are gone, *lettres des cachets*, and some kind or unkind friends, send the witless body to some retreat where the wits of all the inmates are gone. I must, however, in all sober earnestness, return to my subject, or I fear you will say: "Ho is going to Hauwell." Well, perhaps I am, for I know that photography is practised at that admirable institution; and now that I have struck a professional chord, I may as well play upon it.

Lenses and cameras, like birds and flowers, reappear in spring, and, as the season advances and the sun attains a higher altitude, amateurs and professionals are quickened into a surprising activity. Renewed life is imparted to them, and the gregarious habits of man are developed in another form and somewhat in the manner that the swallows return to their old haunts. At first, a solitary scout or reconnoitering party makes his appearance, then another, and another, until a complete flock of amateur and professional photographers are abroad, seeking what food they can devour: some preferring the first green "bits of foliage" that begin to gem the woods with emeralds, others waiting till the leaf is fully out and the trees are thickly clothed in their early summer loveliness; while others prefer a more advanced state of beauty, and like to depict nature in her russet hues, when the trees "are in their yellow leaf." Some

are contented with the old-fashioned homesteads and sweet green lanes of England for their subjects; others prefer the ruined abbeys and castles of the feudal ages, with their deeply interesting associations; others choose the more mythical monuments of superstition and the dark ages, such as King Arthur's round tables, druidical circles, and remains of their rude temples of stone. Some delight in pictorializing the lakes and mountains of the north; while others are not satisfied with anything short of the sublime beauty and terrific grandeur of the Alps and Pyrenees. Truly, sir, I think it may be safely stated that photographers are lovers of nature, and, I think, they are also lovers of art. If some of them do not possess that art knowledge which is so necessary for them to pursue advantageously either branch of their profession, it is much to be regretted; but there is now no reason why they should continue in darkness any longer. I know that it requires years of study and practice to become an artist, but it does not require a very great amount of mental labour or sacrifice of time to become an artistic photographer. A little hard study of the subject as it appears in the columns of your Journal and those of your contemporaries—for I notice that they have *all* suddenly become alive to the necessity of imparting to photographers a knowledge of art principles—will soon take the scales off the eyes of a man that is blind in art, and enable him to comprehend the mysteries of lines, unity, and light and shade, and give him the power to compose his subject as readily as he could give a composing draught to an infant, and teach him to determine at a glance the light, shade, and atmospheric effects that would most harmonize with the scene to be represented. Supposing that he is master of the mechanical manipulations of photography, he has acquired half the skill of the artist; and by studying and applying the rules of composition and light and shade to his mechanical skill, he is then equal to the artist in the treatment of his subject, so far as the means he employs will or can enable him to give an art rendering of nature, fixed and immovable.

I do not profess to be a teacher, but I do think it is much more genial in spirit and becoming the dignity of a man to impart what little knowledge he has to others than to scoff at those who do not know so much. If, therefore, Mr. Editor, in the course of my peregrinations, I see an opportunity of calling your attention, and, through you, the attention of others, to any glaring defects or absurdities in the practice of our dearly beloved art, I shall not hesitate to do so; not, however, with any desire to carp and cavil at them for cavilling's sake, but with the more laudable desire of pointing them out, that they may be avoided. During the coming summer I shall have, or hope to have, many opportunities of seeing and judging, and will endeavour to keep you duly advised of what is passing before me.

My letters may come from all parts—N., E., W., and S.—so that they will, in that sense at least, harmonize with the nomenclature of your periodical. Where I may be at the date of my writing, the post-mark will reveal to you. And now I must consider my signature: much is in a name, you know. I can hardly call myself your "Special Correspondent"—that would be too much *a la Sala*; nor can I subscribe myself an "Old Photographer," for that would be taking possession of another man's property, and might lead to confusion, if not to difficulties; neither can I style myself a "Peripatetic Photographer"—though I am one—for that name sometimes appears in the columns of a contemporary; and my own name is such a long one, consisting of nearly half the letters of the alphabet. Well, I think, all things considered, I cannot do better than retain my old *nom de plume*. And with many apologies for this long round-about paper, and every expression of regard, I beg to subscribe myself your obliged and humble servant,

LUX GRAPHICUS.

March, 1868.

GAS OR OIL LAMPS FOR THE MAGIC LANTERN.

SIR,—While endorsing the very admirable recommendation of your correspondent, Mr. Martin, relative to the non-employment of mineral oils for illumination with a magic lantern, I must dissent from him in respect to the fitness or unfitness of gas. I use gas in a lantern having a 3½-condenser and quarter-plate Voightlander portrait lens, and get exceedingly good effects with a six-foot disc. As a practical photometrist I know that there are very few towns in England in which gas is supplied of such indifferent quality as to give less than the

light of twelve sperm candles when burned in a good Argand-burner at the rate of five cubic feet per hour. I also know, from my own experiments on lamps, that the light given by a good moderator or Carcel lamp does not exceed ten to eleven candles, even when the consumption rises to the high rate of 750 to 800 grains of oil per hour, and the lamp tends to smoke. I cannot, therefore, understand why common coal gas (unless it be very common indeed, and even then the inferiority may to a large extent be compensated for by a larger consumption) can afford much less light than an oil lamp.

Your correspondent shows himself to be so well informed on the subject he writes upon, that I shall be glad to see some further observations on the lamps he considers the best to be employed, and on the comparative effects produced by them and by gas flames. For my own part I will make some trials as soon as my engagements will permit, and communicate the results, if they be of sufficient interest, through the medium of your journal.—Yours obediently,
F. W. H.
London, March 20th, 1868.

PRELIMINARY COATING OF ALBUMEN IN THE WET PROCESS.

MY DEAR SIR,—Mr. Jabez Hughes, in his excellent manual, p. 112, cautions beginners in regard to using again glass for negatives that has once been used; and few who have tried to use the same plates often will do otherwise than endorse his statement. Professor Towler, in the "Photographer's Guide," recommends that a coating of dilute albumen be given to all plates (and, of course, dried) before collodionizing; and in *Humphrey's Journal* of last year he strongly recommends it, more than once, if I remember rightly. Allow me to state my experience in the matter. A few months ago I had collected about a gross of plates, all old, and nearly all varnished, and many of them had been used several times. I boiled them in a strong solution of common soda, then washed them clean under a tap, dipped them for a short time in a dilute solution of nitric acid, washed them again very carefully, and then, while wet, coated them with a solution of albumen, 1 to 20 of boiled rain water, with a drop or two of ammonia to a pint; dried them, and put them away for use. I have now been using these plates for about six weeks, and certainly have every reason to be satisfied with them. There is no possibility by any ordinary fair means to get the film off the plate; it adheres most tenaciously, and stains-streaks and the usual consequence of using old plates are extremely rare. I am, in short, delighted with the plan, but should like much to hear something about it from others who have tried it and failed.

If albumen finds its way into the bath, of course it will soon tell. My plan, before coating with collodion, is always to clean the back of the plate and edges very carefully, and as the collodion then covers the albumen it can be very little that is exposed to the silver solution. At all events, I have not yet been able to see that my bath degenerates any the sooner because of my using these plates.

I should be very glad to learn the experience of any of your readers who have tried albuminizing their plates and have given it up. Apologising for this lengthy epistle, I remain,—Yours very truly,
KENT.

SOME EXPERIENCES WITH BATHS.

DEAR SIR,—In the early part of last season I had a bath of 40 ounces which was laid aside for throwing down, only it was put in the open air, exposed to sunshine and shower. Another and another were laid aside for the same purpose, until there were six; but the sixth had bothered me a good deal at first with white markings, principally proceeding from the two corners next the head of sitter inward. These markings were half way through the film of collodion, and a little raised above the surface; they gradually wore away, however, and, after being used up, it was, like the other, laid aside and a new one commenced; but No. 7 was, if anything, worse than No. 6 in these markings; so I thought I would see what any of my old baths would do for me, and took up my 40-ounce one (the other five contained only 22 ounces of water), which did well for a day. Next day No. 2 was taken up, and did well; then No. 3, &c., with all the rest. No. 7 I have beside me, and hope it will be all the better for rest, and from having been in contact with a few collodion films.

Having tried the strength of the first bath, it was found to

contain only 24 grains to the ounce, so I strengthened it and all the rest to 35 grains with common printing silver, and wrought away with them as before, until Mr. Bovey called our attention to sugar in the printing bath, when, not expecting much more out of these old baths, and having resolved to start afresh with new ones next season, I took it into my head to treat the worst of them to $\frac{1}{2}$ ounce of sugar, and, contrary to my expectations, it did well. Other four were treated to $\frac{1}{2}$ an ounce each, and they also did well, and my old friend of the 40 ounces got $1\frac{1}{2}$ ounces loaf sugar, and it did as well as any of the others, I think even better; and they were all used one after the other as before. And when, lately, our attention was called by Mr. Johnson to permanganate of potash, I thought these baths could not but be full of organic matter, so I took your advice, and got the crystals and put 16 grains into an ounce of water, dissolved them, of course, and put 3 drops into my 40-ounce friend, shook it up, but no pinkish hue; put other 3, and yet other 3, until there were 12 drops added; let it stand awhile, then filtered; it was pretty clear; but I tried 3 drops more, and no signs of the proper hue; then 9 drops were added, and at last the pink went gradually off into the brown; let it stand an hour or two, then filtered, and got a very transparent solution, which the argentometer says contains 34 grains to the ounce, but I am not so very sure about it.

The other five were treated in the same way, and, with one exception, are transparent, and promise well. This one got more permanganate than the rest to bring it to the pink colour, but it positively refused to yield to the treatment, so I was obliged to let it stand awhile, and then filter; and this bath, after filtering two or three times, had a clear pinkish tinge remaining for a few days, but it has gradually changed into a fine light brown, though it has thrown down no deposit as yet. I have not had an opportunity of trying it, or any of the other 22-ounce ones, but have taken a few quarter-plate negatives with No. 1, and it promises to be as good as a new one. It behaved in the same manner as I have seen new baths behave; viz., the first plate bad, the second better, the third pretty good, but a slight deposit on the shadows, which 3 drops of strong nitric acid cleared away.

In respect to photography and disease I may say that, like our friend, D. Welch (*PHOTOGRAPHIC NEWS*, March 13th, 1868, page 130), I have wrought for four years from seven in the morning till nine, ten, and sometimes twelve at night, doing everything in connection with the requirements of a small business in a somewhat remote country place (with the exception of a little assistance in printing and mounting), and believe he is right when he says "the great temptation to over-exertion in summer, and irregularity in taking food, are greater enemies to photographers than their chemicals."—I am, dear sir, yours truly,
W. C.

Alexandria, Dumbartonshire, Scotland, March 17th, 1868.

[Some cards subsequently produced from a negative obtained with one of the corrected baths are very bright and clean.—ED.]

Talk in the Studio.

PHOTOGRAPHING THE ECLIPSE OF AUGUST NEXT.—The *Athenæum* says:—"Major Tennant is going out to India to observe the total eclipse of August 18, with a special view to photography and polarization, the cost of the expedition having been sanctioned by the Secretary of State for India. Major Tennant will be accompanied by three non-commissioned officers of the Royal Engineers, well exercised in photographic manipulation; so that good pictures of all that takes place during this almost unprecedented eclipse may be anticipated."

HYPOSULPHITE OF SODA AS ANTI-CHLOR.—A correspondent of the *Chemical News* says:—"There is a large demand for hyposulphite of soda by paper makers as so-called *anti-chlor*; about 200 tons per annum are yearly consumed in photographic operations alone, while a far larger amount is used by paper-makers; hyposulphite of soda is also used by bleachers of calico fabrics. Sulphite of soda is of a more limited use, and somewhat superseded by the hyposulphite."

PHOTOGRAPHIC INVENTION.—Dr. Loewe, whose name is known to the public in connection with several secret processes for printing on silk, enlarging, &c., has a singular announce-

ment in the daily press, headed "Dr. Loewe's Toilet is made," followed by the statement that in May will appear the "First Proof of One Year of an Inventor's Existence in London, which will be a page from the Book of England, written, illustrated, composed, photographed, stereotyped, printed, and edited, by Dr. J. M. Loewe, Inventor of a Printing Process destined to make a Revolution in the Printing World."

CARBON REPRODUCTIONS.—Mr. J. F. Boyes, of "The Auto-type Printing and Publishing Company," writing to the *Athenæum* on the subject of Braun's carbon prints, now exhibiting, says:—"M. Braun is entitled to the highest credit for the artistic taste with which he has selected the subjects, and the care with which he has reproduced them; but the whole credit of the invention of the process is due to our fellow-countryman, Mr. J. Wilson Swan, of Newcastle, who has sold the right of working his patent in France and Belgium to M. Braun. Mr. Swan's determination to render the process in all respects perfect has been the reason why it has not been better known in this country. Having achieved this result, it may interest your readers to be informed that public attention will shortly be called to the matter, this company having just acquired Mr. Swan's patent for the process."

CAUTION TO OPTICIANS AND PHOTOGRAPHIC DEALERS.—We are informed that orders for lenses have been sent to more than one photographic optician, dated from Noble Street, Wood Street, stating that the goods are required for exportation, and promising cash on delivery. In one case an order was supplied, but no cash was forthcoming. In another case an invoice was delivered, with an intimation that the goods were ready on payment of the cash, but no further application for the goods followed after this condition was stated. Our commercial friends will do well to be on their guard.

PHOTOGRAPHING CHILDREN.—A correspondent sends us a somewhat curious advertisement copied from a Canadian paper. The advertiser is a photographer, and informs the public that "the pictures taken at this establishment are celebrated all over the world, and every where else." He announces "photographs taken in all kinds of weather," adding, however, "Bring small children on bright days only, but leave their fathers and mothers at home."

To Correspondents.

A READER OF THE NEWS.—The accidental mixture of sulphate of soda with your hyposulphite does not render the latter unfit for use, as no injurious effect will be exercised upon the prints. You must take care, however, in making a fixing bath, to estimate the amount of sulphate of soda present in weighing out the hyposulphite.

J. F. BUTLER.—The clearing process to which you refer as practised by Mr. Osborne was not for the purpose of reducing the intensity of negatives, but rather a step in a process of increasing intensity. Its object was to remove any trace of deposit on the transparent parts of a negative after development with iron, previous to further intensifying, in order to secure very dense, clean negatives, giving perfectly black-and-white prints in reproductions of prints, plans, &c. His method consists in the application to the fixed negative of an extremely dilute solution of iodine and iodide of potassium, until any foggy deposit on the transparent parts becomes converted into iodide of silver; this is then easily dissolved off by a solution of hypo or dilute cyanide. You will find the process stated on p. 485 of our Sixth Volume, or on p. 42 of our Year-Book for 1864.

EDUCATOR.—In reproducing woodcuts you require to secure a perfectly clean and bright negative at the outset, free from any deposit on the shadows, either from over-exposure or fog. Any trace of such a deposit will acquire colour when treated with bichloride and a sulphide or iodide, and materially interfere with the contrasts required in the picture. You will find the gelatino-iron developer will aid you in securing bare glass in the shadows. Use, also, old collodion and an acid bath. See, also, answer above, as to a method of clearing negatives of the kind in question. One of the best modes of securing perfect opacity is as follows:—After fixing and washing and removal, if necessary, of any foggy deposit on the shadows, treat with a 5-grain solution of iodide of potassium until the film is of a uniform grey; wash, and apply a 1-grain solution of iodide of potassium until a yellowish-green tint is obtained; then wash, apply pyrogalllic acid and silver in the usual manner. Almost any degree of density can be so secured.

A. P.—Many patents have been taken out for colouring photographs at the back, and then rendering them transparent. We do not think that any of them are now in force.

H. S.—The streaks on the print sent have much the appearance of being due to the glass rather than the bath. Have you satisfied yourself on this head? The negative is a little over-exposed, and the development pushed too far. Try adding a little nitric acid to the bath; expose more fully, and let us know the result.

J. C. S.—The lens you mention is not suitable for the production of interiors; all single lenses will give you curved marginal lines. The exaggeration of the foreground is not due to any construction of lens, but to the use of lenses of too short focus; the defect is therefore incident to all wide-angle pictures. The magnesium lamp may be successfully used for illuminating objects for photographing; but it is not suitable, we fear, for interiors of churches, as the accumulation of the smoke is an objection.

F. W. H.—Thanks for the interesting examples of your mode of utilizing photography, which appears very valuable for the purpose.

W. B.—We are not personally familiar with any one whom we can recommend. Mr. D. Rees, of 3B, Broadway, Ludgate Hill, advertises lessons on moderate terms, and we have seen some of his work in tinting cards, which is good.

W. J. A. G.—The PHOTOGRAPHIC NEWS is published in the Office on Friday morning at 9 o'clock. It goes to press on Thursday evening, and all copies required for post are posted during the night. We are glad to learn that you now get your copies in satisfactory time; the paper was under other business management when you received it late. We have been able during the last few months to make many business improvements.

ENQUIRER.—M. Petit Jean's method of silvering glass is as follows: Prepare two solutions, the first containing 3 drachms of nitrate of silver and 1 drachm of strong liquid ammonia in an ounce of water; after filtration add 16 ounces of distilled water; then add, a drop at a time, half a drachm of water containing 7 grains of tartaric. A second solution is then prepared containing twice the proportion of tartaric acid. The glass, having been thoroughly cleaned and dried, is heated to about 120 degrees, and covered with the first solution. In about ten minutes the deposit of silver commences, and is completed in about fifteen minutes more. It is then rinsed and covered in like manner with the second solution; and after about a quarter of an hour it is washed, dried, and polished.

ANGUS.—We shall have pleasure in inserting your communication if you append to it your own name; this is due to the gentlemen whose name you mention. Honest men, whether they are fearless and outspoken or not, do not make charges against others by name whilst they conceal their own names and shelter themselves in the dark.

R. M. G.—Your frequent head-aches may possibly arise from constantly inhaling the vapour of ether. The first effect of ether is stimulating; the reaction is of a depressing character, and may frequently be attended with head-ache. But remember that head-aches are amongst the most frequent symptoms of indigestion, and may arise from many causes, especially long fasting followed by hearty eating, by unsuitable food, by late and heavy suppers, by want of exercise in the fresh air, by sleeping in small ill-ventilated chambers, by excessive use of tobacco or alcoholic stimulants. See that you avoid these causes before you attribute your suffering to photography. See that the dark room is as well ventilated as you can make it; and if it be difficult to make the ventilation perfect, get your employer to aid you.

W. C.—Your cards have many good qualities, being generally bright and clean. Nos. 1 and 7 we like best. The chief defect consists in your use, in many cases, of too light a background. For vignettes, the background you employ is very good, but it is too light for figures fully printed out, and gives a somewhat hard effect. Your heads would gain greatly in roundness, delicacy, and vigour if they had a dark background behind them in place of the light one you employ.

HENRY HELE.—The book to which you refer is not recently published. It has been out many years, and was reviewed in our pages about half a dozen years ago. There has not been any new edition.

E. H.—We called once, but without seeing any one who could give us the information. We will ask the manufacturer to send particulars by post.

B. M.—The patent lens will answer as well as the triple for enlarging. 2. Of the three you mention, if you only wish to purchase one, select the triple; if you purchase two, then the other two, leaving the triple.

Several Correspondents in our next.

Photographs Registered.

- Mr. S. THOMPSON, York,
Photograph of Monument to the Officers of Enniskillen Dragoons.
- Mr. SEED, Bristol,
Two Photographs of Mr. W. T. Turpin.
One Photograph of Bishop of Kilmore.
- Mr. R. SLINGSBY, Lincoln,
Photograph, from Drawing, of a Fancy Ball.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Photography and Disease.....	157
Actinic Light Transmitted by Different Kinds of Glass	158
Echoes of the Month. By an Old Photographer	158
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey.....	160
The Magic Lantern and Photography. By James Martin.....	161
Pictorial Effect in Photography. By H. P. Robinson.....	162

	PAGE
Photography as an Aid to Archaeology. By J. Henderson	163
Researches on Dry Plates. By M. Carey Lea	164
Proceedings of Societies—Oldham Photographic Society—Liverpool Amateur Photographic Association	166
Correspondence—Photography and Disease	167
Talk in the Studio	167
To Correspondents	168

PHOTOGRAPHY AND DISEASE.

THE general tendency of the evidence furnished by the experience of photographers as stated in many letters, some of which we have published, confirms the position we assumed some weeks ago, in commenting on the cases then submitted for our advice. We expressed a conviction that the practice of photography, when pursued with a prudent attention to the conditions of health, was not necessarily injurious; but that the too frequent disregard of ventilation in the dark room and studio, the careless contact with dangerous poisons, and the neglect of regularity in taking food not uncommon amongst photographers, together with the constant mental strain, were fruitful causes of debility and suffering. A letter from a gentleman in active practice as a physician, who is also an enthusiastic amateur photographer, confirms these views, and offers some valuable suggestions for the benefit of our readers. He says:—

“The question as to how far the practice of photography, under fair conditions, is prejudicial to health is not an easy one to answer without reliable and statistical evidence. I have myself been an ardent follower of the art for seventeen years, and till last year, when I was poisoned with cyanide of potassium, could trace no indisposition to its practice; but I am not disposed to regard it as altogether innocuous.

“That it might be rendered comparatively harmless I believe, by ordinary precautions, such as thorough ventilation of the dark room, and carefully protecting the hands by india-rubber gauntlets, or, as I formerly mentioned, by using horn forceps in the various operations of sensitizing paper, washing, and toning prints. No medical man can ignore the power, for good or evil, of solutions of nitrate of silver, gold, bichloride of mercury, iodine, cyanide, &c. In this instance it must be for evil, as these solutions in photographic work are all of more than average energy, and are used in quantities, and daily, far beyond the strength any prudent physician would venture to prescribe.

“We are all conscious of the penetrating odour of ether; how for hours it saturates the system, and is unpleasantly perceptible to those not accustomed to its fumes. Long after we have quitted the dark room it permeates the breath, the hair, the skin, and perspiration; and when we consider its anæsthetic properties, designedly given for therapeutic purposes, it need surprise no one if its large and continued use in ill-ventilated studios cause depression, nervous tremors, indigestion, palpitations, vertigo, and a host of other recognized but ill-understood phenomena, which culminate in the term ‘feeble health,’ so often characteristic of the professional photographer’s condition. The dark room should be ventilated, not only from above, but below, to allow the heavy fumes of ether to escape; the hands, during the periods of developing, should be frequently washed, to free them from acetic acid and other impurities; and I would

earnestly suggest to professionals to make exercise—taken in the air daily, both before and after work is over—a part of their religion; to sponge daily with cold water the whole surface of the body; to be temperate in all things; in fact, to neglect none of the usual rules of hygiene now, through the happy spread of the daily press and popular literature, so widely diffused among all classes.

“If these points are fairly considered and acted upon, I cannot think the practice of photography necessarily prejudicial, but I am not surprised that it should be otherwise when I observe in so many studios the supreme indifference to the merest precautions: hands boldly immersed through an afternoon’s toning into gold solutions; studios, one would almost think, purposely unventilated; bichloride and iodine intensifiers handled as if they were milk and water; lumps of cyanide rubbed over the hands to remove silver stains; old collodion used to clean plates, as if the smarting of the eyes, caused by it, were a pleasing pastime; and a total ignoring of all rules of cleanliness and care.

“There is also another phase of photography which I have never seen mentioned: how far the sight is effected, especially in out-door photography, by the sudden transition from the full blaze of sunshine to the comparative darkness of a tent. I have noticed some tents so ill-lighted that development seemed to me to be performed by instinct. The tent and dark room in my opinion should be sufficiently illumined by non-actinic light as to enable the operator to read ordinary print with ease, so that all strain on the eyes should be avoided. I am afraid many photographers will yet rue the day when they subjected themselves with indifference—not to say ignorance—in spite of frequent warning, to such subtle and malign influences. The professional photographer generally knows little of chemical affinities and their potency, and recklessly deals with occult and poisonous materials. It behoves him, therefore, for his own sake, to ‘tak tent,’ and secure for himself all the immunity possible from the often invisible but dangerous agencies that surround him.”

It is not from any desire to excite the alarm of any of our readers, still less to increase the anxiety of the nervous, that we have given some prominence to this question. Our aim is rather, in regard to the latter, to allay apprehension, and point out that the exercise of their profession involves no risk to health which may not be avoided by ordinary prudence and care. The anxious and worrying nature of the photographer’s duties—which, as a valued correspondent, “R. H. P.,” whose letter appears on another page, suggests, is a prolific cause of nervous debility—is not easily removed; but photographers may avoid unhealthy conditions without interfering with the efficiency of their general arrangements. Upon employers we would especially urge the importance of ventilation, for the sake of their own health as well as that of their assistants, and also as

having an important bearing upon the excellence of their productions. The best work will scarcely be produced when the system is in the exhausted and depressed condition which is the inevitable result of the continuous breathing of an atmosphere charged with the vapours of ether and some other substances used in the daily practice of photography.

ACTINIC LIGHT TRANSMITTED BY DIFFERENT KINDS OF GLASS.

We have been favoured by Mr. Gaffield, of Boston, United States, whose valuable experiments on the action of sunlight on glass we recently brought before our readers, with an interesting photographic print illustrating the degree of light transmitted by certain samples of glass he has examined. In this instance the experiment was intended to determine the degree of chemical action exerted by light after passing through certain samples of new glass. Fourteen examples of glass, each four inches by two, were placed side by side, duly labelled so that each should in printing register its own description on a sheet of sensitive paper, and submitted for three minutes to direct sunshine; and the print before us presents the result of the experiment, which is curious and interesting.

One half of the sheet was covered with glasses of the colours of the solar spectrum in their due order—red, orange, yellow, green, blue, indigo, violet. The nature of the colouring matter used in the respective samples is not stated, and we know that this is an important element in the power of the glass to transmit or obstruct actinism; but we assume that the glasses were selected each as pure and bright examples of its colour. The red, orange, and green have, during the exposure in question, entirely checked the transmission of actinic light, and no action whatever has taken place on the paper; whilst, curiously enough, the yellow shows a delicate tint of grey, indicating decided action of light. Blue, of course, has transmitted the most actinic light of any of the coloured samples; indigo, however, being scarcely inferior in its power of transmitting light. Violet obstructs a very large proportion of the light, the blue having transmitted at least three times as much. The other portion of the sheet is covered with samples labelled as follows: black, porcelain glass, Belgian sheet glass, Belgian sheet ground, American crystal sheet, English crown, French white plate. The black glass, as might have been anticipated, obstructs the passage of actinic light entirely. The porcelain glass, which is the American term for opal pot metal, transmits light in a degree slightly superior to the violet glass. The chemical action appears not to have been retarded in any appreciable degree by the grinding of the Belgian sheet, as whilst that glass unground transmits the light decidedly most perfectly (the paper being appreciably blacker under it than elsewhere), the same sample ground does not appear to transmit light in any degree less than the American, English, and French clear samples. This is very curious, and requires explanation, as ground glass is generally found to obstruct a very large proportion of light—in some photographic experiments as much as 60 per cent. of illuminating power being cut off when the light has passed through ground glass. English crown, American crystal sheet, and French white plate, appear to transmit actinic light in about the same degree, and decidedly more perfectly than blue glass. The Belgian sheet is, however, decidedly the most perfect sample of those tried in the illustration before us. This accords with former experience which has come under our notice regarding this glass, which is also one of those least liable to change.

Mr. Gaffield informs us that he is still at work upon his experiments with the changes effected in glass by the action of sunlight. The photographic illustration of the varied degrees of change produced by exposure during various periods, from a day to a year, are sufficiently marked for definite observation; although even in a year, in many cases,

the alteration is very slight. In the final chart of results, showing the progressive changes in a period ranging from one year to ten, a most valuable record will be secured, for which the photographic community will be deeply indebted to Mr. Gaffield, whose valuable labours will doubtless direct attention to this subject—hitherto so little considered—in a degree commensurate with its importance.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

HEALTH OF PHOTOGRAPHERS—DISORDERED NITRATE BATHS, AND MODES OF RESTORING THEM—PHOTOGRAPHY WITHOUT A NITRATE BATH—REWARDS TO INVENTORS, AND SECRET PROCESSES—PRESENTATION PRINTS—THE EDINBURGH COMMITTEE ON M. SALOMON'S PRINTS—SOCIETIES.

The effect of the practice of photography upon the health of its devotees, to the discussion of which you have recently opened your columns, is a question which touches the interests of the majority of your readers, amateur or professional, very intimately. Your correspondent "Hypo(chondriac)," who thought the complaints of photographers who suffered from ill-health should be answered with good-natured railery, is doubtless one of the fortunate persons who enjoy good health. "He jests at scars who never felt a wound." But it has been my fortune to know a good many professional photographers who have persevered manfully in the discharge of onerous duties in spite of a sore amount of suffering and debility, charged, if not due, to the pursuit of photography; and I have further known zealous amateurs who have been absolutely forbidden by their medical men to apply themselves longer to their favourite pursuit. The question, it cannot be doubted, then, becomes a very important one: Is the practice of photography injurious to health? We know well that many trades have their especial diseases: the painter suffers from the action of lead salts; the grinder from the dust of the metal he polishes; the looking-glass maker from mercury; the lucifer-match maker from phosphorus; the electro-plater from cyanide; and a host of others incur, from the varied special causes involved in their daily occupations, sufferings which embitter life and bring on early decay. Is photography legitimately chargeable with any of these things? This question will, I hope, receive a conclusive answer in the course of the discussion. For my own part, I think not; and whilst I know that many photographers suffer ill-health from causes arising out of the practice of their art, I do not think that photography is an unhealthy occupation *per se*. That it is made so by ignorance, thoughtlessness, or recklessness in many cases, however, there cannot be a doubt. I have the happiness of knowing a very large number of the ablest men in every branch of our profession, and I can scarcely remember one who does not suffer seriously at times from debility; but I am inclined to believe that it is traceable, in almost every instance, not to the prudent practice of photography, but from over-taxing themselves: working anxiously as well as energetically. With the successful, the struggle to excel; with the unsuccessful, the struggle to exist; with all, the heat of the glass room, and the worries attendant on the duties there: the varied effluvia of the dark room, and the anxieties occasionally arising from pinholes, matt silver stains, fog, splitting films, dissolving films, hard varnish, bad paper, &c., operating on the nervous and irritable temperament, which is common amongst photographers—all these things are necessarily common causes of ill-health incident to, but not necessarily arising out of, the practice of photography. The discussion of the question must have the good effect of making photographers a little more careful in the handling of dangerous poisons, and a little more considerate, probably, of the ventilation of the dark room. The majority of dark rooms have anything but an agreeable atmosphere. Joey Ladle, in Dickens' last Christmas story, states that taking in the vapours of wine

"through the pores," instead of through "the convivial channel of the throttle," makes a man "muddled and melancholy." I don't think that the vapours of ether, acetic acid, cyanide, &c., taken through the pores, can, under the best of circumstances, have a very elevating effect, and it must be worth a little effort to avoid them.

From the diseases of the photographer to the disorders of his nitrate bath is an easy step. During the seventeen years the collodion process has been before the public, the nitrate bath and its troubles have been a prolific theme for discussion. Numerous have been the remedies proposed, and enthusiastic the supporters of each; but, alas! no universal panacea has yet been discovered. Addition of the oxide of silver, followed by an infinitesimal dose of nitric acid; neutralizing and sunning; boiling; freezing; precipitating as carbonate, and redissolving in nitric acid; dosing with cyanide, have each in turn been regarded as the certain cure, and each remedy doubtless has its especial value; but the nitrate bath is no more amenable to the action of a universal panacea than is the constitution of man. Within the last month or two, three novel modes of dealing with the nitrate bath have been brought before photographers. Mr. Cherrill proposes to save trouble, if not to prevent disease, by using common water in place of distilled water. Capital advice, I should think, when good distilled water cannot be had, inasmuch as the photographer will begin with common water under the conviction that it contains impurities to be eliminated, whereas he often fancies that distilled water must be pure, and that it requires neither testing nor treatment of any kind, a fancy which often involves disappointment. My friend Rejlander's remedy of keeping his bath in daylight, whenever it is out of use, seems an excellent notion. If sunning occasionally be good, to throw down organic impurities which have accumulated, the constant exposure to daylight, to throw down these impurities as fast as they accumulate, seems a very rational proceeding. Whether any other troubles will be induced by this mode of procedure remains to be ascertained by experience. The method of curing the bath of fog caused by similar accumulations, to which Mr. Johnson has called attention, seems to be one of the most simple of all the remedies; but still we shall require the record of experience before an absolute decision is made in favour of the use of a permanganate. I have heard in more than one instance that whilst fog is dismissed, pinholes are induced, by this treatment. Is this so?

Shall we ever dispense with the nitrate bath? It is clear that it can be done in the preparation of dry plates. I was glad to see Mr. Bolton's interesting article, again calling attention to the use of collodio-bromide of silver, in your columns last week. My essays with the process have not been extensive, but have convinced me of its value; and the plates prepared by it, sent out by the Liverpool Company, are wonderfully excellent. If such perfect dry plates can be prepared without the nitrate, it will be strange if we do not eventually succeed in superseding the wet process by a better and simpler process, in which all the sensitive agents are held in one vehicle like collodion. I have often wondered that a collodion containing iodide and bromide of silver, merely requiring immersion in a dilute silver solution to supply free nitrate, has never been brought into use.

The necessity or desirability of some means of rewarding inventors who may give their inventions to the public has often been discussed, but, unfortunately, no available plan has yet been devised. I was forcibly reminded of the importance of the subject the other day whilst reading the letter of Mr. Henderson in your columns, in which he stated that, incidentally to the working out of a new photographic enamel process, he had made certain other valuable discoveries, amongst which were, a permanent printing process without salts of silver, a new intensifying process, &c. The uncertainty and costliness of the patent system form a barrier to this mode of protection, and although Mr. Hender-

son would willingly publish some portions of his discovery for the benefit of photographers, he could not do so without publishing the secret of that part of which he wishes to make commercial use in order to reimburse himself for time and money expended in working it out. The necessity, under such circumstances, of preserving secret processes which might be valuable in the daily practice of the photographer is much to be deplored, but at present I do not see any remedy.

I am glad to learn that the Photographic Society is about to adopt the system of distributing presentation prints, and that plenty of volunteers were found willing to provide express subjects for distribution. Mr. H. Claudet's offer to present to the members a print from the last negative of his late father, which had fortunately escaped the fire, was a happy thought. The fact that the portrait was taken with the topaz lens in which Mr. Claudet was so especially interested gives the portrait a distinctive value, not simply as a scientific curiosity, but as a souvenir of the especial efforts of Mr. Claudet at all times in endeavouring to improve the appliances of photography. It is just the kind of illustration of his interest in photography and of his attachment to the Photographic Society which Mr. Claudet would himself have had pleasure in seeing so distributed. The three prints promised will, we doubt not, be worth more than the year's subscription to the Society.

The proceedings at the last monthly meeting of the Society were interesting. A capital paper by Dr. Mann on the difficulties of an amateur in South Africa, a paper written in an admirable spirit, occupied the chief part of the evening. At the North, the election of officers, the reading of the annual report, and a paper on the magnesium light, by Mr. Solomon, illustrated by the production of an enlargement, occupied the evening. At the South, the "Question Box" was called into requisition, and an instructive discussion of the value of permanganate of potash for rectifying disordered baths ensued.

At the Edinburgh Society, the Committee appointed to examine one of M. Adam-Salomon's prints presented its report, which is a little puzzling. It states that the print was first sponged, which removed the whole of the retouching, causing the high lights and the drawing of the eyes, mouth, and shading of the face to vanish; and that the print was then treated with turpentine, which removed the encaustic which diminished the transparency of the shadows, and showed them to be bronzed from excessive over-printing. The puzzle to which I just now referred arises from the fact that, as the first operation of sponging, before removing the encaustic, washed off the retouching, it follows that the retouching was effected after the print had been treated with encaustic paste, the colour being applied upon its waxed surface, a most difficult thing to accomplish, and presenting a rough, patchy effect when done; or, having been done on the unwaxed print, the coating of wax over the retouching, which it required turpentine to remove, was no protection to the retouching, but permitted it to be removed by a sponge and water. This circumstance is puzzling; but, be it as it may, it is not more puzzling than that the operation should have been undertaken at all. The prints exhibited at the meeting a little more than a month ago were, according to the statements of the members, very palpably touched: this being so, it ought not to have required the destruction of a beautiful picture to ascertain a fact that was so palpable as to admit of no discussion. The experiment is clearly inconclusive as to the general character of M. Salomon's pictures. To have given it any value, the operation should have been performed on one of the prints which did not appear to have been retouched, and if the treatment to which it was submitted demonstrated that it was really retouched, and had deceived the eye, then a general doubt as to the source of superior excellence in the whole might naturally have been entertained. All that has now been demonstrated is, that the colour upon a print, the re-

touching of which was easily detected by the eye, could be washed off. If M. Salomon had put this individual print forward as an untouched print, or if he had made any statement as to the general absence of retouching in his prints, or if any one had put forward such claim for him, this result would have possessed some value, as showing that some of the prints were touched; but, as it is, it demonstrates nothing. I am told that it has been urged, in defence of this act of Vandalism, that the print belonged to the Society, who purchased it for the purpose. This excuse would have been good if any one had impeached the honesty of the proceeding; but it scarcely meets the question of the good taste of a society sitting in judgment on the works of a private individual who has never challenged the opinion of such a tribunal; nor does it give a conclusive character to an inconclusive proceeding.

At the Oldham Society, in the absence of a paper, an account of M. Salomon's studio, as described in the *PHOTOGRAPHIC NEWS*, was read. Many a pleasant evening's discussion or conversation might often be secured, I fancy, if, in the absence of a paper, this course were pursued. The Liverpool Amateur Society held a successful soirée.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

REMARKS CONCERNING SENSITIZING SOLUTIONS.

The sensitizing bath employed in photographic printing has so frequently been made a subject of controversy and apparently exhaustive comment, that it would seem a bold and hopeless task to attempt further arguments with a view of throwing any additional degree of light on the matter; but the absence of any fixed principle, the altogether unscientific concoctions frequently recommended, together with the uncertainty that attends the subject, take it all in all, offer proofs louder than can be by words expressed, that the question of silver baths need further ventilating. Be it, therefore, my congenial task to enter upon the important topic, and, if possible, to submit an hitherto unpalatable mass of crude formulæ to the ordeal of criticism, until the whole can be harmonized and placed on a sure and strictly scientific basis, without which it were vain to look for certainty, for nature in her operations never works capriciously or by the rules of chance. If, in seeking a certain result, either caprice or chance is thought to interfere, let it be accepted as an axiom that ignorance is at the root of the matter. It is clear that we must try again; we have failed in detecting the ruling principle.

My dear photographic reader, I now address you on a matter which has often perplexed you, oft has set you wondering whether some imp of mischief was the presiding genius of the art you love and practice; and your bewilderments have not been removed by the thousand-and-one hints you have carefully copied from the various journals devoted to photography; and in your hour of difficulty you have been ready to cry: "Oh! for a Mentor to guide me through this labyrinth of mystification." My dear reader, be you Telemachus, I will assume the character of Mentor, and our Ulysses will be truth, as it may be applied to the subject we are discussing; so without further delay we shall at once enter on the subject of a silver bath by showing, first, the duties it has to perform; second, the varying formulæ adopted will be scrutinized, that we may discover whether or not thorough efficiency and a due economy are combined in happy union.

First, then, the part a silver bath plays in the formation of a sun picture. It will be remembered that, in my last, I pointed out the conditions observed by the paper albuminizer. The chloride salts and organic matter he adds to the paper are the precludes without which the silver bath would prove comparatively actionless and useless. Setting aside the adjuncts employed in sensitizing solutions for the present, we will indulge in the supposition

that nitrate of silver only is present in solution. Now, nitrate of silver, as I have, on more than one occasion, endeavoured to explain, is a very unstable salt, as may easily be shown by the insoluble compounds it forms when combined with most kinds of matter for which silver has an affinity, this being in accordance with a chemical law that two soluble substances must readily unite, when the resultant is an insoluble compound. The paper, by floating, is brought into immediate contact with the nitrate of silver, and the chemical operations commence at once; the chlorine leaves the base with which it was associated, and unites with the silver, forming the more sensitive medium known as chloride of silver. At the same instant a portion of the silver forms, with the albumen, another insoluble compound, recognized as an albuminate of silver, which is erroneously described as coagulated albumen. Both these compounds are sensitive to solar light, the first eminently so; the albuminate makes ample amends for being less so by the additional vigour and stability it imparts to the photograph, which is only capable of withstanding, comparatively unscathed, the action of the various chemical attacks it undergoes when a due proportion of the reduced organic body is present. Yet one more, and no less important, part has the silver bath to perform: besides satisfying the combining matter, it is imperative that it also supplies a portion of nitrate of silver to serve as food when reduction, by the action of light, begins. Summarizing the whole, the duties to be performed by the sensitizing bath may be stated as follows:—

1st. It must provide the active material to produce, by combination, the requisite amount of chloride of silver, which is the most sensitive agent present in a sensitized sheet of paper.

2nd. It has to supply the necessary amount of silver to combine readily with the albumen; otherwise the albumen is dissolved, and the print will lack brilliancy and vigour.

3rd. It must, after satiating the chemical agents, supply sufficient free silver, without which no presentable sun picture can, in silver, be formed.

With this brief summary we approach the question of formulæ such as are usually adopted by photographers, and our business will be to select from among them the one best qualified to meet the threefold conditions above enumerated.

First, then, we purpose reviewing the silver bath pure and simple, such as you, my dear Telemachus, pin your faith to. You say that your 60, 70, and 80-grain baths fulfil, in an eminent degree, every duty I have described. Granted; but cease your admiration to enquire whether either do so strictly and economically. True, an ample supply of the silver salt is present. The chloride of silver readily forms, the albumen is quickly rendered insoluble, and a wide margin is allowed for the supply of free nitrate. True; but of this last I have to complain; the margin is too wide, if you, by and by, admit my views concerning toning matters to be correct. With a well-balanced toning bath, a print obtained from an over-dose of free nitrate is too vigorous, and the delicacy that is the chief charm which makes up the exclusiveness of a photograph is lost—dead—buried in an unsightly bronzing. Here the question arises: If such things be as Mentor describes them, how on earth are we to proceed? My dear Telemachus, ere I reply to your query, let me favour you with an axiom that will, anon, prove the correctness of the new doctrine I am endeavouring to instil into your mind. Nature is a thrifty labourer; she has never yet been found using up one fraction more of matter than is absolutely necessary. Proof: look at a silver print when well produced; it is bold, yet delicate, and throughout there is no lack of vigour; yet that picture is composed of a few atoms of silver whose infinitesimal weight can scarce be estimated. Why, then, may I ask, do you employ so large an amount of the precious metallic compound, creating waste and adding to your expenses to no trifling degree? Say you reduce the proportion of nitrate of silver down to one-half: would you not supply enough and to spare? "The albumen would resent the insult by quitting the

paper," you reply; and your remark brings me to dwell for a few moments on the subject of weak baths. Probably no greater boon connected with photographic printing was ever presented than the suggestion offered by a certain "Publicola," who, I believe, was the first to propose the addition of a neutral salt as an adjunct to the silver bath. Since that time many are they who have ploughed with the heifer then provided, and numerous are the substances advised by the compounders of weak silver baths: nitrates of sodium, potassium, magnesium, and I don't know the number of others that are marshalled as the possessors of some distinct virtues when added to the silver solution. My dear Telemachus, it is all "bosh," as Brother Jonathan quaintly hath it. What would you think of the wisdom of Mentor if he were to advise you to adopt a formula stated as follows:—

Silver nitrate	...	...	...	60 grains
Rain water	...	...	...	$\frac{1}{2}$ ounce
Aqua dist.	...	...	...	$\frac{1}{2}$ "
Pump water	...	...	...	$\frac{1}{2}$ "
Snow water	...	...	...	$\frac{1}{2}$ "

You certainly would imagine that much thinking had made him foolish; yet I must ask pardon when I say that the additions often recommended as fit and proper for the office of silver-savers are marked with wisdom equal to the formula just rendered. Seriously, it matters not whether nitrate of potash, of soda, of magnesium, or any other nitrate applicable, is added to the printing bath. By abundant experiment I have satisfied myself that their operations are on the neutral side, passive, never active; and were I not pressed for space I could summon an array of argument that I think would bear me out in the assertion. As matters stand, I simply describe the part played by the neutral salt. When an albumen surface is brought into contact with water the albumen dissolves, and a dried, unglazed paper-surface only remains. In a minor degree a similar result occurs when a small portion only of silver is present in solution. If, however, the density of the solution is increased, its solvent powers are diminished. Still silver must be present, or saturation itself will not suffice to render the concentrated neutral mixture capable of preserving the albumen intact. Yet it strangely happens that the most minute quantity of silver present will exercise an influence. I have secured a really tolerable print with 5 grains of nitrate of silver to the ounce of otherwise neutral saturated solution; without the neutral salt the small amount of silver described would have been lost and useless. To cut a long story short: after a lengthened experience, I have arrived at a conclusion that no better formula for a sensitizing bath can be adopted than that given as my offering to the YEAR-BOOK, and is there stated as follows:—

Water	...	...	...	80 ounces.
Silver nitrate	...	...	...	6 "
Soda nitrate (pure)	...	...	...	3 "
Loaf sugar	...	...	...	2 drachms.

The reason why and the wherefore must, however, stand over until my next, as I am unwilling to trespass on space. And it to myself appears more prudent to cut short at once than to risk a clip of the editorial scissors that oft shows up in all its saddening disappointments that tantalizing sentence, "To be continued."

THE MAGIC LANTERN AND PHOTOGRAPHY.

BY JAMES MARTIN.

No. 9.

As the single lantern is incapable of producing the beautiful dioramic and other effects possible with the dissolving view apparatus, I should advise my readers, if possible, to obtain the possession of the latter. It is not so complicated as might be supposed. It merely consists of two lanterns of the usual construction, mounted on a stand, and moving upon pivots in any direction, so that the disc of light from each lantern may be thrown on the screen one exactly upon

the other, so as to appear as if there was but one. This is essentially necessary, as many of the changes (such as, for instance, a summer scene to that of winter) are produced by two pictures, one in each lantern, the leading outlines of which are in every respect the same, except that one represents the scene as in summer, with foliage, running water, and green fields; the other the same trees, but bare of leaves, the water frozen, and the fields covered with snow. In this case, should the two discs of light not be correctly superposed, the effect will be the same as if, when taking a photograph, the camera has by some accident been moved during the exposure, thus producing a double outline. The obscuration and melting of the views into each other, called dissolving, and from which effect the double lantern takes its name, is effected by an apparatus fixed in front. These are of various kinds; the purpose of all is, that while the light is gradually shut off from one, that from the other is admitted by degrees. The following arrangement is one of the most simple and effective. Two pieces of sheet iron, out of each of which a semi-circular aperture has been cut, are placed before the tube of each lantern, and arranged upon slips of wood in such a manner that, by means of a small winch, the two pieces can be made to move in contrary directions at the same time, so as to gradually close one aperture entirely while the other is progressively opened in the same ratio, until it admits the passing of the whole of the light from it. There are various kinds of dissolving view apparatus: such as the binocular, which is one lantern having two nozzles, one placed above the other; the dioptric, in which the light is thrown upon glass prisms, from thence upon the screen, and lighted by the oxycalcium light (by this contrivance only one light is required); and one gas bag (of this class is the opaque lantern, which is very ingeniously contrived). Lanterns have also been made with three sets of lenses; but, taking into consideration the additional loss of light, expense, and complication of arrangement, I believe that a well-made pair of lanterns on the usual plan will be found the most generally useful. These, with a pair of good lamps, for small-sized pictures for parlour exhibitions, and an arrangement so that the hydro-oxygen light can be used for larger sizes, or when a stronger light is desirable, will leave little to be desired. A microscope should also be added, and will be found a most amusing and instructive addition. It should have two powers, a lower one for large objects and a high one for very small ones. This cannot be shown except by the hydro-oxygen light.

I have so recently given instructions as to the management of the oil lamp that I need not here repeat them. I will therefore only add that dipping the wick in vinegar, and drying it before use, is said to cause it to burn free from smoke; but the size and height of the lamp-glass chimney has much to do with the clearness and brilliancy of the light. The hydro-oxygen light is composed of two gases, which require to be mixed in certain proportions, either before or while burning. The apparatus consists of a pair of india-rubber bags, generally of a wedge-shape, each of which should be able to contain from 5 to 9 cubic feet of gas, according to the length of time of consumption and power of light required. These are furnished with stop-cocks, to which unions can be attached connected with the tubes which lead to the blowpipes. These tubes are better made of vulcanized india-rubber, which will not collapse when trod upon; about 12 feet in length each will be found sufficient; at the other ends these tubes are attached to T unions, from which short tubes convey the gases to the blowpipes, which are of various construction. I have found those answer well that are composed of two tubes, one within the other, carrying the gases on separately until within a short distance of the orifice of the blowpipe, where they become mixed, and so issue upon the heated lime cylinder. By this contrivance there is so little mixed gas that no explosion can be caused on that account. To these short tubes are affixed two small stop-cocks, by which the flow of each gas is regulated as required; before each blowpipe is a support, on which is placed the lime cylinder.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER X.

"Connection is a principle always present to the painter's mind, if he deserve that name; and by the guidance of which he considers all sets of objects, whatever may be their character or boundaries, from the most extensive prospect to the most confined wood scene; neither referring everything to the narrow limits of his canvas, nor despising what will not suit it, unless, indeed, the limits of his mind be equally narrow and contracted; for when I speak of a painter I mean an artist, not a mechanic.—*Sir Uvedale Price.*
—"*What is Truth?*" said jesting Pilate: And would not stay for an Answer"
—*Bacon.*

BEFORE placing figures in a landscape, the artist should first make up his mind whether the composition requires the introduction of any object to add to its completeness. If it does, do not let anything induce him to take the view without the figure, because he will be doing something that he can see could be done better with the assistance of a little more trouble; above all, he should avoid incongruity, and never, for the sake of pleasing a friend by putting him in the picture, introduce an element of discord, such as was illustrated in the Sixth Chapter.

If perfect pictorial success is to be expected, no more figures than are absolutely necessary should be introduced. One figure more would be a useless blot, and injure the effect. Care must be taken that the figures compose well in relation to themselves as well as to the landscape. In too many photographs figures are to be seen straggling over the foreground, perfect strangers to each other, to all appearance, united by no purpose whatever, except that of having their portraits taken at a great disadvantage. It, of course, may happen that in some scenes in nature figures may be found scattered over a scene in the way set forth in many photographs, and a picture of them would be quite true, and would, therefore, satisfy the desires of the matter-of-fact truth-at-any-price school, who scoff at "art-knowledge;" but it is the purpose of the artist to represent agreeable truth, or at least truths that do not irritate the eye, as false quantities jar upon the ear in verse. I am quite aware, and go as far as any in agreeing, that the real enjoyment of art is in proportion to its entire truth; but the agreeable sensations produced by pictorial representations are dependent in a very great degree on the spirit and knowledge with which that truth is rendered. Form only will not give this, neither will light and shade alone; but the union of both, although colour may be absent (but which is necessary to *perfect* beauty), suggests that truth to the mind which is one of the great functions of art. The best quality of photography is this perfect truth, this absolute rendering of light and shade and form; and a knowledge that he is debarred the charms of colour should cause the photographer to be more careful to make the most of the qualities which his art possesses, and which are beyond the reach of the painter and the sculptor. It is not open to the photographer to produce his effects by departing from the truth of nature, as has been the practice with the painter for ages; but he may use all legitimate means of presenting the story he has to tell in the most agreeable manner, and it is his imperative duty to avoid the mean, the base, and the ugly; and to aim to elevate his subject, to avoid awkward forms, and to correct the unpicturesque. Having digressed thus far in search of "what is truth," we will return from the bottom of the well to our figures.

The figures and the landscape should never be quite equal in interest or pictorial value. The one should be subordinate to the other. The picture should consist of figures with a landscape background (if they are represented in the open air), or of a landscape in which figures are introduced merely for the sake of impressing a point or adding life to the more important scene. It is true, indeed, that pictures are sometimes produced, with good effect, the converse of this, and the figures vie with

the scene in interest, but the subjects must be fine, or the success will be hazardous.

It is difficult to give general directions for doing that which must, after all, have a special consideration in each case; it would therefore be next to impossible for me to give more definite directions for the introduction of figures in landscapes than has already been stated in this and former chapters; but I may sum up the subject by saying that the figure must be *of* the subject, as well as *in* it, in order that unity may be preserved; that it must be used with a purpose, to give life to a scene, or to supply an important spot of light or dark; to give balance, or to bring other parts into subordination by being either blacker or whiter than those parts; and that what is to be avoided is the indiscriminate dragging in of figures into scenes in which they have no business, and where they do nothing but mischief. Perhaps the best lesson on this subject is to be obtained from the observation of photographs in which figures have been successfully introduced—if with the assistance of a competent teacher, all the better. For this purpose nothing could be better than a few of Blanchard's stereoscopic views, especially the series taken recently in the Isle of Wight, in which the most subtle art has "grasped the skirts of happy chance," and has converted topographical views into gems of most rare quality. Every one of these little pictures that I have seen is *made*, pictorially speaking, by the figures introduced. Not figures—mark the difference!—that he has found haphazard and photographed instantaneously, although they are chiefly so-called instantaneous views, but figures that he has met with on the spot, certainly, but has arranged with great judgment and taste according to their avocation, or in accordance with the requirements of the scene. Sailors, coastguards, children, or the more prim-looking visitors, all look what they are, and are doing that which it is their nature to do; and all this not only without the least sacrifice of artistic truth *according to law*, but with very great gain from an observation of the laws of light and shade and composition as generally received.

By way of tail-piece to this chapter and to this branch of my subject—for, with the exception of a chapter on the sky, and incidentally when I come to the consideration of chiaroscuro, I have done with landscape composition—I give a little vignette showing how simple a subject will serve to make a picture. How often do photographers travel over miles of country without finding anything they consider worthy of their attention, although, perhaps, exquisite subjects may exist at every turn of the road! The art of photography has arrived at a sufficient state of perfection, in its own way, to prevent us having any fear in acknowledging that it is not possessed of unlimited power; that the sublime cannot be reached by it; and that its power is greatest when it attempts the simplest things. But if it is not the mountain that it can represent best, what art can equal it in its representation of the molehill? And for this reason I conclude my chapters on landscape with an illustration of the class of simple subjects for the representation of which the art is pre-eminent. The illustration will show how a basket, a hamper, a stone, a log of wood, a barrel—all, or any of these—may be made valuable when a foreground presents nothing of especial interest in itself, and how, by their presence, they at once give tenderness to the distance and space to the picture.



PHOTOGRAPHY AS AN AID TO ARCHÆOLOGY.

BY J. HENDERSON.*

ARCHÆOLOGY has been defined as "the science of teaching history by its monuments; that is, by every monument of man which the ravages of time have spared." "By the study of the past we advance the interest of the present, and know how to make use of it for the benefit of the future."

This being the case, the reproduction by means of photography of objects of antiquity is one among the numerous applications of our art which is now receiving, as it deserves, no small share of attention.

A great deal may be urged in favour of the readiness with which copies of various objects may be made by hand, of their cheapness, durability, and the ease with which they may be multiplied; but against these may be set the absolute truthfulness which is inseparable from a photograph when taken under proper conditions; the facility with which they also may be produced; the great advantage of a stereoscopic combination of views; lastly, with regard to permanence, the carbon and allied processes, and greater care in the production of silver prints, point at least in this direction, while the simplicity of our own collodio-bromide process commends itself for yielding excellent glass transparencies, which, when encased in Canada balsam, would seem to defy the ordinary wear and tear of time.

My attention was first drawn to the subject of my paper by reading a letter in the *Times* in January last, wherein Mr. C. P. Stevens stated he had been enabled to form certain conclusions from photographs of flint implements from gravel pits at Malton, in reference to which a vexed question was raised. In a letter to me, from the Blackmoor Museum, Salisbury, that gentleman says: "I had a flint hatchet photographed yesterday; but for such objects photography is not very useful, as the yellows come out too dark."

"For matters of detail photography is admirably adapted, or for mere form. Our museum is set apart for pre-historic archaeology, and for weapons, and so on, in use by modern savages, as illustrating the collection, and photographs of rare forms of clubs, spears, ornaments, tools, weapons, &c., are useful and valuable to us. We also collect photographs of the Aborigines of various countries, and for this nothing is equal to photography, because artistic licence is impossible."

"For dolmens and other megalithic structures photography is a magnificent agent; likewise for sculptured stones of the early periods. Of course I do not now allude to any application of the art as available for other than purposes of archaeology."

"Our county archaeological societies employ photography largely in their work, and the Hampshire Society also. Some photographs of the Roman city of Silchester were taken during a recent visit of that Society to the spot."

Many important historical monuments are in inaccessible positions, which the artist has to visit hurriedly, filling up subsequently the details of his imperfect sketches. This photography does effectually on the spot. Many objects of antiquarian interest are fragmentary, and form a mere portion; the probable outline of the whole has to be deduced; others—such as cinerary urns, bones, and implements, and also Roman frescoes—when exposed after ages of interment, rapidly crumble in our atmosphere, and are lost for ever. A sketch is often attempted by a rude draughtsman, where a photograph would render invaluable aid.

The character, date, and evident use of objects, as in the foregoing instances, are frequently determined by the situation and other circumstances under which they are found, and here our art is of great use.

I have, on a former occasion, referred to "architectural photography," and now, in relation to the archaeological part of the subject, I may add that, although the architect will learn more by making a careful sketch of an old building, yet you will very seldom find two sketches of the same sub-

ject which agree perfectly, while the time and skill necessary to copy the endless intricacies of detail (say) in a Gothic building, would be better spent in taking a few photographs of the same. Photographs show the difference in the courses of masonry, which often determine relative dates. They also show the juncture of work of different periods and later insertions; and in connection with this subject I may urge the desirability of photographing churches, &c., before and after restoration.

As illustrating and adding force to what I have said, I may remind you of what has been done by our own Government, by public and other bodies, and by individuals who have employed photography for the purposes I have named.

By command of Her Majesty, photo-zincography has been employed to reproduce in facsimile a selection of the national MSS. of England, from the Conquest to the reign of Queen Anne. Thus far, 230 have been published, to which the Domesday Book must be added. About 80 MSS. of Scotland are already in the hands of the public, and more of that country, and also Ireland, are to follow. By the same process some municipal and other archives have likewise been copied.

The Ordnance Survey of Stonehenge and of Turnaschau (I. of Lewis) is accompanied with illustrative photographs.

In a communication received after the rest of my paper was written, Mr. C. J. Stevens, in speaking of the value of the Ordnance photographs of Stonehenge, refers to his remarks upon them in the *Athenæum*, also to Mr. Parke's photographic illustrations of the "Antiquities of Wells," and after enumerating photographs of Celtic and other relics (including those of the Swiss lake dwellings), he proceeds to say: "The stone axe from Malton, and the beads from whence it was derived, are chiefly known to archaeologists by the published photographs of them;" and concludes thus: "An artist is not necessarily an archaeologist, and he may slur over or misrepresent some trifling (to him) detail. I have a photograph of a church, with the village, cross, &c.; upon the latter, even the chalk scribbings of boys are shown. No artist would have taken this; but in a strange country and with all to learn about the antiquities and the people, such minuteness is invaluable."*

The India Office has published an important work with photographic illustrations: "The Textile Manufactures and Costumes of the People of India"; and the Indian Government has recently directed the whole of the ancient buildings of India to be photographed.

The Ordnance Survey of Jerusalem has been the means of many valuable photographs being taken there, and the Hon. Secretary of the Palestine Exploration Fund also says: "We have already materials for almost an entirely complete and accurate map of the country, and photographs of more than 300 spots and objects, large numbers of which have never before been taken."

There are catalogues of photographs of about 10,000 objects of antiquarian interest in South Kensington Museum, not to mention the numerous photographs taken of loan and other collections, and also at the British Museum.

While making a passing allusion to the use made of photography by our English and other Antiquarian Societies, I may mention that the Archaeological Society of Rome have proposed to photograph any antiquarian discoveries they make, and send copies to the Society of Antiquaries in London for publication. One account says: "Mr. J. H. Parker is proceeding with a collection of photographs of the ancient monuments of Rome and the Campagna, with a view to facilitate the researches of archaeological students, and demonstrate the successive styles of Roman construction during the periods of the kings, the republic, and the empire." At that date about 500 photographs had been so taken.

The mysterious remains of Egypt have attracted the attention of photographers from the first. Frith was early in the field, and was followed by Bedford, who also illustrated

* Read before the Liverpool Amateur Photographic Association, March 31.

* I am indebted to Mr. Stevens for the permission to use his remarks, which were not intended for publication.

Palestine, Greece, &c. The Vicomte de Rougé, in his mission to Egypt in 1863-4, produced six volumes of hand copies of inscriptions and 220 photographs.

Professor Piazzzi Smyth lately took 166 photographs at the Pyramids (many for the lantern) and 50 stereo views. Most of them were taken "solely with a view to procuring aids to scientific enquiry." They were produced on glass slips, 3 inches by 1 inch, exposed while in the bath, and they include eleven views in the interior of the Great Pyramid by magnesium light. He prefers stereo views taken with two cameras, and very justly urges the taking of distant objects with the cameras placed widely apart. This, I think, we might often do with advantage, using one stereo camera, first taking one half and then moving the camera and re-focussing for the second half.

In this connection I ought to mention the labours of Thompson among the ruins of Cambodia; Fergusson and Hopley in Indian architecture; and Svaboda at the Cave of Elephanta, likewise in Mesopotamia and on the sites of the Seven Churches of Asia; Hellsby has illustrated some of the antiquities of South America; and a new work on Central America by Squier is, I believe, to be illustrated by 3,000 photographs, and any one acquainted with the elaborated monuments of that country will admit that by no other means could fair representations be given.

It would be tedious to enumerate the volumes bearing on antiquities which photography has illustrated, either directly by silver or other prints, or as furnishing a ground-work to the wood-cutter. In "Sinai Photographed, or Contemporary Records of Israel in the Wilderness," Lord Lyndhurst suggested the application of photography "as the only way so to certify their copies of the inscriptions as to silence cavil." Noel Humphrey's interesting work on the "History of the Art of Writing" is cleverly illustrated by photography.

Our art-science has been employed, to some extent, in illustration of old coins and medals, also in copying old mosaic pavements on a reduced scale. Some time since Mr. Rejlander turned his attention to the ancient brasses for which our country is so famous; and, by super-imposing rubbings on sensitized paper, obtained copies same size as the originals. I am of opinion that negatives of the rubbings, reduced to a known scale, would yield equally useful and more convenient prints.

Of the numerous works of antiquarian interest I will only mention "The Ruins of Pompeii"; but I may mention that, as its counterpart in this country, "Uriconium," a photograph previously taken, was useful in enabling 120 columns of a hypocaust to be restored after they had been wantonly overthrown.

Some of the details at Iona, and upwards of a hundred photographs at Melrose, have been taken, the latter embracing everything of constructive or ornamental interest; and it is somewhat in this spirit that I would urge the copying, by photographic means, wherever practicable, of such works of antiquity as remain to our own day, as well for the purpose of study as for transmission, if possible (either in the form of negatives or prints), to posterity, to whom the originals may be partially or entirely lost.

The portico of the Temple of Drudeia, on the Nile, was added by Tiberius, but against this recent acquisition may be set the fact that Egyptian monuments known to exist in the fourteenth century are now no more. Of some treasures of antiquity now lost, only rude representations have come down to us; for example, on the arch of Titus at Rome we have some of the sacred trophies from the Jewish Temple, and, in this country, drawings of the famed shrine of St. Thomas of Canterbury, only exist on portions of an undestroyed window, and in a partly burnt manuscript.

The idea I have suggested may appear speculative, if not visionary; but who shall say whether our art-science may not be the means of much more being known hereafter of men and things as they existed in the nineteenth century than could have been had photography been unknown?

Let me conclude in the words from the "Essays of Elia":—

"Antiquity! thou wondrous charm, what art thou? that being nothing, art everything! When thou wert, thou wert not antiquity; then thou wert nothing, but hadst a remoter antiquity, as thou calledst it, to look back to with blind veneration, thou thyself being to thyself flat, *jeune*, modern! What mystery lurks in this retroversion? or what half Januses are we that cannot look forward with the same idolatry with which we for ever revert! The mighty future is as nothing, being everything! The past is everything, being nothing!"

RESEARCHES ON DRY PLATES.

BY M. CAREY LEA.*

NEW PROCESSES.

I SHALL now proceed to describe the new processes referred to at the commencement of this paper.

Several years ago I described a method of developing both positives and negatives with the aid of a lead-salt. I did not claim to have discovered that lead-salts impart additional activity to gallic acid, but I showed how this principle could be advantageously used. Gallic acid precipitates acetate of lead, and in the earlier experiments this muddy mixture was employed. I showed that clear solutions could be got with acetate of lead by adding a sufficient quantity of acetic acid beforehand, which prevented precipitation; and that with nitrate of lead no precipitation tended to form, even without the need of employing acetic acid. I showed that the effect of acetate of lead was so extraordinary as to multiply the power of the gallic acid fifty-fold, so that, instead of using gallic acid in the proportion of 5 grains to the ounce, it might be reduced, with the aid of acetate of lead, even to 1-12th of a grain to the ounce; and that in the proportion of 1-6th of a grain to the ounce it was a very powerful developer. This method was not only extensively used, but, I am sorry to say, was extensively borrowed, with trivial alterations and somewhat scanty acknowledgments. In Paris it was made the foundation of a secret process. Vials containing the two solutions were sold at the rather extravagant price of thirty-eight francs. Some of the contents having been forwarded to Dr. Schnauss for analysis, his examination resulted in showing that the materials used were precisely those which I had indicated.

I have applied this principle in an entirely new direction, to the preparation of dry plates, instead of to developments, and with excellent results. A plate is coated with collodion-bromide, and is thrown, as soon as set, into a bath of acetate of lead, acetic acid, and gallic acid. It is then simply dried, without any other treatment, and so gives an excellent dry plate, very sensitive, and giving satisfactory negatives. The details are as follows:—

In 16 ounces of ordinary acetic acid (not the glacial) dissolve one drachm of acetate of lead. Prepare also a 60 grain solution of gallic acid in alcohol. Both will need filtering; both will keep a long time, probably indefinitely.

To make a bath suitable for a 4-4 plate, take 1 ounce of the lead solution, 1-4th of an ounce of the gallic acid solution, and 6 ounces of water. Add the lead solution first. No precipitate or troubling will take place (unless, perhaps, in some water containing a large proportion of sulphates, in which case, either use distilled water, or filter and add a little more lead solution), and the bath is ready at once. It is better to prepare three such baths, for the plates are made so rapidly that, otherwise, delay will occur for want of a bath to put the plates in.

The collodion is the same as that before recommended, viz., 8 grains bromide of cadmium, 2 grains bromide of ammonium, but with 7 grains pyroxyline to the ½ ounce of alcohol and ½ ounce of ether. Sensitize with 16 grains of finely pulverized nitrate of silver to the ounce.

The quality of the pyroxyline to be used is of very great

* Continued from p. 152.

importance, as in most dry processes. Common negative cotton is not suitable, but a powdery pyroxyline of the intense sort is necessary. That sold as "Helion No. 1" gives very good results. It is curious that the intense pyroxyline which give the least sensibility with wet plates give the greatest with the dry. Of course, the collodion will be better after standing a while.

To obtain a smooth plate with collodio-bromide requires more care than with plain collodion. Pour on plenty, commencing far up the plate. Get it quickly to the upper corners, and then bring it down as squarely as possible; avoid the necessity, as far as practicable, of bringing it down first on one side and then on the other, and get it down as straightly as possible. To do this the supply must be abundant. Pouring off requires especial care, or else an uneven band will be formed across the upper end of the plate. To avoid this, raise the further end of the plate in pouring off very slowly and regularly; give the plate a wide, slow, rocking motion. Attention to this will be found important.

I should have said that the plate, before collodionizing, must have an edging of india-rubber dissolved in benzole.

The variation upon this process consists simply in washing the plate after collodionizing, and before plunging it into the bath. This makes a great difference in the plate. Treated in this way, and with a moderate exposure, clear, bright negatives are got, resembling very closely those afforded by wet plates, and showing as positives by reflected light. The deeper shadows are represented by clear glass; there is a complete absence of veiling, and brilliant pictures are easily got; but the great sensitiveness of the plate is materially diminished, the exposure is prolonged (must be from one-half more to double), and the details in the shadows are not so well preserved. I prefer, therefore, as a general thing, the first-described system, in which the plates are plunged into the lead bath as soon as set, and without preliminary washing. And I would call attention to the fact that, so far as I am aware, no one has previously proposed any method in which plates prepared in any other way, either with collodio-bromide or in any other form of the collodion process, can be sensitized without a previous washing. This new mode of operating has the double advantage of saving time and trouble, and giving a better result. It seems especially applicable for the preparation of dry plates in travelling, as the two greatest difficulties are done away with—the nitrate bath and the washing—for water with which to wash the plates made on a journey is apt to be scarce in quantity and of extremely doubtful quality.

ANOTHER MODIFICATION.

An interesting modification of this process is one in which the lead and gallic acid are introduced into the collodion. For this purpose, add powdered acetate of lead to acetic acid in as large quantity as it will take up. Add 5 drops of this and 15 of a 60-grain alcoholic solution of gallic acid in alcohol to each ounce of collodion, using for this purpose the same collodion as above described, likewise sensitized with 16 grains of nitrate of silver to the ounce; after standing, decant the clear portion into a measuring-glass, and add, first the lead solution, stirring well up; and then the gallic acid. Collodionize, using the same precautions as before described.

These plates, after collodionizing and setting, will simply need washing for about five minutes under the tap, and are ready for use as soon as dry. The negatives obtained resemble in all respects those obtained by that modification of the previous described process in which no washing is used. They are very sensitive, and give soft pictures. All these plates are intended for alkaline development, respecting the proper application of which a few words should be said.

ALKALINE DEVELOPMENT.

The form of alkaline development which I have found most suited to these plates is as follows:—

1. Carbonate of ammonia in 20-grain solution.
 2. Pyrogallie acid, 300 grains dissolved in 5 ounces of alcohol.
 3. Bromide of potassium, 2 drachms in 5 ounces of water.
- I prefer to develop in pans, and take:—
- | | | | | | |
|-----------------------|-----|-----|-----|-----|----------------------|
| Water | ... | ... | ... | ... | 6 ounces |
| No. 1 | ... | ... | ... | ... | $\frac{1}{2}$ ounce |
| Nos. 2 and 3, each... | ... | ... | ... | ... | $\frac{1}{2}$ drachm |

This quantity, placed in a 7 by 9 porcelain pan, conveniently develops a 6 $\frac{1}{2}$ by 8 $\frac{1}{2}$ plate. The plate, after previous wetting, is left to itself in the solution for about half an hour. The dose of carbonate of ammonia is then trebled, and intensity soon comes; if it does not, the plate is left in until it does. I do not recommend washing off and using silver and pyro, but finishing entirely with the alkaline treatment.

MANAGEMENT OF COLLODION.

It is better, after adding the silver, to shake violently, and repeat this once or twice in an hour or two, then let repose for twelve to twenty-four hours. In this way no filtering is necessary.

After finishing a set of plates, add to the residue of the collodio-bromide 1, 2, 3 or more ounces of the bromized collodion, enough to more than saturate all the excess of silver (half as much fresh as what remains is plenty; more will do no harm); mark the quantity on the bottle, so that, in adding the next lot of nitrate of silver, it may be taken into account. Thus the operator may go on indefinitely, as Mr. Mawdsley has pointed out.

It must be well understood that even after this addition, the collodion, though less sensitive, is still very much so, and must be carefully preserved from light, and should be kept in a cool place.

SELF-DEVELOPING PLATES.

I published lately a description of a method of preparing plates which would spontaneously develop themselves in the dark slide, given rather as a matter of curiosity, however, than of decided utility. Continuing, from time to time, my experiments with it, I obtained very irregular results, especially in respect of fogging. By continued investigation, however, I have succeeded in ascertaining the sources of these irregularities, and in getting rid of most of them. Of the fogging, which was the most serious trouble, I got rid entirely. I give here the results which I found.

1. A picture which will develop itself entirely and not need redevelopment will require a strong, bright camera-image, such as is only got with short-focus lenses and with large diaphragms. The exposure must be as long as for a common tannin plate.

2. But, with shorter exposure, a visible image can be got, which redevelops easily to any strength desired.

3. The images lose, to an unusual extent, in the fixing, and therefore allowance must be made for it, or else the pictures will need to be returned to the developing bath for a few moments after fixing and washing.

4. Owing to the glycerine used, care must be exercised to rock the plate, though, thoroughly, otherwise crapy lines will result.

5. The same cause, the glycerine in the collodion, diminishes the adhesion of the films to the glass, causing them to slip. This is avoided by using a substratum of albumen, by the aid of which the plates will bear rough handling and rough washing with impunity.

6. *Fogging*.—This trouble showed itself in a very perplexing way. Sometimes films prepared with a large (comparative) excess of nitrate of silver showed no trace of fogging, whilst at others this result was precisely reversed. It was finally ascertained that the fogging depended wholly upon the condition of the collodion; after fixing these conditions with certainty, no difficulty was found in preparing films so entirely free from all tendency to fog that the plates, after removing from the slide, could be left in plate-boxes for weeks without undergoing any change.

As above explained, collodion, after being silvered, remains for a variable time in a condition that it gives blue and transparent films, and then changes and gives creamy opaque ones. Now, whilst the latter condition is the best for the preparation of plates intended to be used dry, the former—the bluish condition—is absolutely essential for plates to be used wet. This distinction is one of no small importance, and, by attending to it, all danger of fogging with these self-developing plates is avoided.

The best method of operating is to use the above-described collodion, adding to it $1\frac{1}{2}$ grains of nitrate of silver to the ounce. Shake long and well, and set aside for from one to four or five hours. The colder the temperature the longer will the collodion remain in the blue condition, and the longer time may be allowed for settling. Decant all but the bottom portion into a measuring-glass, and add to each fluid-ounce:—

Alcoholic solution of gallic acid (60 grains to the ounce) ... 10 minims
Pure concentrated glycerine ... 10 drops

If preferred to drop the gallic solution, 15 drops may be employed instead of 10 minims. As the glycerine is too thick to measure in a minim glass, it needs to be dropped. The gallic solution must be filtered perfectly clean. Stir up thoroughly with a glass-rod, remove all bubbles with a piece of paper, and collodionize the plate.

From what has been said in the previous part of this paper, it is evident that the collodio-bromide mixture used for these plates must be fresh. In working with dry plates we may save the residue by adding a certain quantity of bromized collodion, enough to bring the alkaline bromide into large excess, and thus these portions may be set aside to be re-sensitized when wanted. But this cannot be done with the self-developing plates, because they must have sensitive collodion which has never passed into the creamy state. Collodion, therefore, for the self-developing plates must be mixed, shortly before it is wanted, of entirely fresh materials, and in a clean bottle. Such portions as may remain over must be rejected, whether or not the gallic acid has been added.

I have been able further to improve upon this process by the agency mentioned already in connection with the regular dry process here described. I allude to effects produced by a lead salt. If a strong solution of acetate of lead in acetic acid be made, and 4 or 5 drops of this be added to the sensitized collodion just before use, and immediately previous to the addition of the gallic acid as here described, a better plate is obtained than where gallic acid is used alone. It is more sensitive, gives a bolder picture, and does not seem more disposed to fog if the precaution be used of using the blue film.

Although this process is a curious and interesting one, and quite novel, it is not to be compared, I think, with those described before it. The exposure is longer, and the films require more care to keep them on the plate. It is, however, certainly remarkable that a collodion film can be put into condition to go on slowly developing itself spontaneously, and yet show no disposition to fog.

CONCLUDING REMARKS.

It has been the object of the writer in making these researches to find a process, which whilst giving thoroughly satisfactory results, should dispense with the complicated manipulations which render dry processes uninviting. He believes that the processes described in this third part will be found to have accomplished this result, especially that one in which a plate is simply collodionized, then as soon as set, plunged into the lead bath. It is believed that no one before has proposed to apply a sensitizer to a collodion plate containing pure nitrate of silver, without previous washing, and that it is here for the first time shown that this mode of operating gives a more sensitive plate with less work than the ordinary methods. By the mode of proceeding here directed this sensitizing bath is not rendered

troubled or cloudy by the immersion of the washed plate, but remains perfectly clear.

Of the various methods which he has described the writer is disposed to recommend this one, applying the modification of washing before using the lead bath, where a bright clean plate with clean glass in the deep shadows, and plenty of contrast is desired; for general use, however, omitting the washing. By preparing one or two washed plates in each set, and making a W in the corner with a diamond, or even simply scratching a cross with a broken file, the operator will have plates suitable for all needs, the washed plates being reserved for wide views well illuminated throughout, and in which it is desirable to preserve and even to increase the contrasts which actually exist, whilst for all other uses the unwashed plates will have the preference.

Proceedings of Societies.

OLDHAM PHOTOGRAPHIC SOCIETY.

THE Ordinary Meeting of the above Society was held on Thursday, the 26th inst, the President, Mr. JOHN GREEN, in the chair.

After the minutes of the previous meeting had been read, Mr. James Hall was duly elected a member.

Messrs. WOLSTENHULME then handed round a couple of negatives, one being marked with small spots and streaks, the other being quite good, and all that could be expected. Messrs. Wolstenhulme stated that they were both from the same bath, taken immediately after one another, which caused a lengthy discussion.

Messrs. WHITEHEAD and HEATON then exhibited a tent made expressly for out-door work.

Mr. HEATON stated that the tent he considered to be the most convenient one he ever used, and he had worked in several. It was what he might call a modification of Leak's, it being constructed for holding the bath, legs, and everything requisite, and could be placed under a railway seat when travelling. It was very much admired, and considered to be as perfect a tent as any photographer could wish. Mr. Heaton then read his paper on Out-door Photography. (This paper, owing to the pressure in our space, is unavoidably left over until our next).

A vote of thanks was passed to Mr J. Selwape, of Rhodes, for some very beautiful prints for the portfolio; also to Mr. Heaton for his paper, which brought the meeting to a close.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE Ordinary Monthly Meeting of this Association was held on Tuesday evening, the 31st ult., the President, the Rev. G. BANNER, in the chair.

The minutes of the two previous meetings having been read,

Mr. GREEN said he wished to call attention to one of the minutes of the January meeting, referring to the picture presented to the Hon. Secretary, which had not been fully reported. The following is the inscription upon the picture, and will explain matters fully:—"This photograph, being the largest hitherto taken by the collodio-bromide process, is presented by the Liverpool Amateur Photographic Association to their Secretary, Mr. W. Bolton, to whom photographers are mainly indebted for the discovery of the method of producing a photograph without a bath; and in testimony of his zeal in promoting the objects of the Association."

Mr. HENDERSON was then called upon to read his paper entitled "Photography as an Aid to the Study of Archaeology," (see p. 163) at the conclusion of which a number of very excellent photographs illustrating the paper were passed round, and also several volumes of photo-zincographic copies of old manuscripts, &c., including the Domesday Book for Lancashire and Cheshire.

A vote of thanks having been accorded to Mr. Henderson,

The Rev. T. BANNER said, that the subject Mr. Henderson had chosen was one which might be enlarged upon to almost any extent. He quite agreed with Mr. Henderson as to the superiority of photographs over drawings. He himself had made a sketch of a Norman gateway, near Oxford, which had occupied him two days, and which might have been very

much better done in two minutes by photography. He also thought that no faith was to be placed in drawings; he had compared an engraving of Sardinia, which was in his possession, with one of Svaboda's pictures of the same subject, but could trace no resemblance between the two. He concluded by thanking Mr. Henderson for the trouble he had taken in collecting matter for his paper.

Mr. HENDERSON said that whatever trouble he had taken had been a pleasure to him; for he had been led into very pleasant correspondence and instructive reading.

Mr. NEWTON made some remarks bearing upon the use of photography in copying old pictures and other works of art, the series just introduced showing the complete success which might be attained.

Mr. FORREST then read a paper on "The Satchel Camera," and exhibited his camera and stand, the latter of which received the greater share of attention. It is constructed upon the tube principle, and packs up in the form of an umbrella.

Mr. FORREST pointed out that his dark slides were painted yellow inside, and this he stated he had found to completely stop blurring.

Some discussion took place on this point, the unanimous opinion being, that painting the back of the plate is the only way of effectually staying the evil.

A vote of thanks was passed to Mr. Forrest, who had gone to a great deal of trouble and expense in obtaining from London one of Moucheven's enlarging cameras, which, unfortunately, was not put to any practical use.

Mr. HUGHES passed round two negatives on plates prepared by the Liverpool Dry Plate Company, which had been developed nearly three months after exposure, which, though taken during December, possessed so much delicacy and half-tone as to rival any process, wet or dry.

The Rev. T. B. BANNER said he had been using some of the same plates for portraits. He had exposed one plate one minute, and obtained a beautiful negative, and another exposed two minutes was ruined by over-exposure. The plates were not new, but were some that he bought last year.

Mr. HENDERSON stated that he had seen a collection of photographs taken before the gold toning had come into use, and though the majority of the prints were quite faded, some still remained perfect, showing that it is possible to prevent even a sulphur-toned print from fading.

Mr. Green's prize photograph was awarded to Mr. W. H. Wilson.

Mr. HUGHES and Mr. HIGGIN exhibited some enlargements from microscopic objects, which were considered very good indeed.

The meeting adjourned rather later than usual.

Correspondence.

PHOTOGRAPHY AND DISEASE.

DEAR SIR,—I feel grateful for the opportunity you have given your readers and correspondents to discuss in your columns the question, "Is photography inimical to health?" And, as we may expect your own judicious and careful summing up on the facts elicited, I trust a true answer may be obtained.

I quite agree with Mr. Hall, in your last number, that a perfect solution could best be obtained by comparison of the general photographic experience; but then nothing short of a special census would avail, and of this I fear there is no hope. For my own part, I am inclined to think that the worry and tension of mind usually inseparable from professional work have more to do with the deficiency of health often found amongst photographers than the effluvia of the dark-room. Add to this the uncertain hours and irregular strain of work and variable times for meals, and you have a condition of things that in any other calling would be considered almost unbearable.

Looking round (mentally) on my acquaintances in the profession, I do not think I could point to one who is "the picture of health," as I might amongst (say) the grocers of my town, and I think it is more this below-par condition that is prevalent than decided ill health, though that is not very rare, I believe. Men of science, and those engaged in any brain work,

do not, I am aware, stand a chance of keeping up the physique like him "who feeds fat oxen," a fact which proves that nature's golden mean of mental and bodily labour cannot be transgressed without loss; but in most other walks of life there are more numerous times and hours of relaxation than, as a rule, fall to the photographer's lot; and hence the mind and body, from running incessantly in one groove, show signs of wear and tear at length. The public, too, are scarcely so considerate as might be desired, and often press for sittings at holiday times (when "decked in all their best" no additional time or trouble is needed for a separate dressing), and the good-natured photographer seldom holds out against the importunities of his customers supported by the claims of his purse. Perhaps, also, the unfair competition, which often has to be met by extra diligence and unswerving care, adds the pressure from other quarters; but this, fortunately, is waning, and for those who have weathered both the storms of prosperity and adversity there seems a prospect of something like halcyon days.

Probably one result—and not the least—of the various communications you have received on this topic, will be, that photographers will, as much as possible, avoid all injurious contact with their chemicals, and believe in the wisdom of giving that useful servant, the body, its due, by air, exercise, and rest—things that in these "express" days are apt to be forgotten.—I am, dear sir, yours truly,
R. H. P.

PS.—I have just been informed that one of the cleverest photographers in Clifton (Mr. Beattie) has had to resign his business from ill-health, it is thought, photographically induced.

Talk in the Studio.

THE SCIENCE OF THE SUNBEAM.—Mr. Jabez Hughes recently delivered the closing lecture of the season at the Isle of Wight Philosophical Society, his subject being the Science of the Sunbeam. Our space precludes the printing here of even an analysis of a most eloquent lecture, which was, we understand, one of the most successful and brilliant delivered during the session.

PHOTOGRAPHIC SOUVENIR OF TASMANIA.—In the midst of the public demonstrations in honour of the visit of H.R.H. Prince Alfred, Duke of Devonshire, to Tasmania, photography played its part. At a farewell banquet the Prince was presented with an album of photographs of Tasmanian scenery, which had been under the directions of the Preparation Committee, for presentation to H.R.H. the Duke of Edinburgh, from the colonists, as a memorial of his visit to Tasmania in H.M.S. *Galatea*. The album was a most beautiful and costly volume of improved size, bound in crimson morocco, gilt, and ornamented in an elaborate and tasteful manner. It contains 83 photographs illustrative of the scenery of Tasmania, 48 portraits of children born in the colony, and 9 plates immediately connected with the Prince's visit. The title-page was drawn by Mr. Alfred Randall, and illustrated by Mr. W. C. Piquenit. H.R.H. was pleased to request that the Preparation Committee would furnish him with duplicate copies of all the pictures for the illustration of a work which H.R.H. is preparing in connection with his visit to the Australasian Colonies.

A HINT AS TO LABELLING NEGATIVES.—A correspondent sends us the following useful hints:—"In putting away my negatives, at the back and at one end of each a slip of albuminized paper, about one-third of an inch wide, is stuck on; upon this the No. of negative, and S. or R., according to which paper suits the quality of negative (Saxe or Rive), and D. if (as some subjects, I find, need) deeper printing than ordinary is required. By this means, on taking a negative out of the box to print from, it tells its own tale, and produces the same results as the first proofs. I was led to do this from the fact I had had brought under my notice, that after the first order sent to a photographer, the prints were rarely up to the mark in subsequent orders."

SOUTH LONDON EXHIBITION MEETING.—Members are reminded that the meeting of the Society to be held on Thursday evening, the 9th instant, is to be devoted to examination of, and conversation on, photographs, which members are invited to contribute for the occasion.

To Correspondents.

TO AGENTS AND ADVERTISERS.—Next Friday being Good Friday, the PHOTOGRAPHIC NEWS will be published on Thursday, April 9th. Advertisers should send in their Announcements not later than Wednesday, the 8th.

EDUCATOR.—The causes of collodion giving a thin transparent film may be various: deficiency of pyroxyline, deficiency of iodide, or lack of porosity or permeability in the film will cause it. The latter cause may be the result of the use of a pyroxyline giving a horny, repellent film, or the use of anhydrous solvents; if the latter, the addition of a drop or two of distilled water to each ounce of collodion will remove the defect; if the former, time will be the best cure. If deficiency of iodide is the cause, it may be remedied by the addition of about half a grain of iodide of cadmium to each ounce; but this is rarely required. The addition of a little more pyroxyline is often of service in securing a creamy film and a vigorous negative. About a grain of good pyroxyline to each ounce of collodion will often effect an improvement.

J. H.—We recommend common sheet glass as most suitable for a studio, being cheapest and least liable to change under the action of light. If a small space is to be covered, a 15-ounce glass will be sufficient; if a larger space, a stronger glass (say 21-ounce) is better.

Z. H. A.—The proportion of acetate of soda you use is very excessive. The usual formula is 30 grains to 1 grain of chloride of gold; you are using 600 grains. You also use the bath too weak; 10 ounces of water to each grain of chloride of gold will give a very dilute bath; 5 ounces of water are sufficient. The tendency of excess of acetate of soda will be to prevent the keeping of the bath, causing it to become gradually inert, and tone slowly and imperfectly.

F. F.—A ridge-roof room, with the side and roof facing north, glazed, and the other side opaque, will be best. The space you have at your disposal must determine the proportions. Secure as much length as you conveniently can.

J. C. G.—We cannot recommend the instruments of any maker by name here. If you will send us a list (you may find some in our advertising columns), distinguishing each by a number, we can advise you as to which is most suitable for your wants.

T. S. (Biggleswade).—Water purified by the addition of a little nitrate of silver and sunning is suitable for making silver baths, but not for other photographic purposes. It would not be suitable, for instance, for making a toning bath, because the nitrate of silver remaining in solution would decompose the bath and throw down the gold. The yellow precipitate you describe is probably oxide of gold.

M. CAGE.—In the formula to which you refer, where acetic acid simply is mentioned, glacial acetic acid, which is that commonly used in photography, is meant. It is only when a deviation from the usual standard is intended that the qualification need be stated; hence, when the weaker acid is intended, Beaumont's is mentioned. It is about one-third of the strength of the glacial acid. 2. The solution or paste of bees'-wax is used after the print is mounted on ordinary cardboard. Care must, of course, be taken to avoid touching the margin; this is easily done. Mr. Blanchard has given up the commercial application of collodion to his prints, not because he lost faith in it, but because, printing extensively, his assistants complained of the effect of the ether. He now uses the wax instead. Any trace of iodine in collodion for prints would be injurious. The bees'-wax treatment is cheap. 3. We saw the portrait to which you refer, and noted, also, the want of honesty to acknowledge it. Such a copy, unacknowledged, is, of course, piracy.

W. A. (Southampton).—We addressed the note and forwarded it. You are probably aware that the firm is passing through the Bankruptcy Court, which may account for the delay to which you refer.

W. N. AND S.—The ridge-roof form is best, placing the side towards the north. This is the form and position employed by the best men. 2. The decision as to the use of wood or iron depends upon circumstances. We should prefer wood to iron; or, if we employed iron, we should have it lined with wood.

W. J. A. G.—You will find the additional particulars you require, beyond those given by Mr. Bolton, in our YEAR-BOOK for 1866. A 15-grain tannin solution may be used. The difficulty in sending out collodio-bromide of silver ready for use consists in the fact that it is apt to precipitate in process of time, and, as Mr. Bolton states, should not be prepared more than a few days before it is required for use. We are not aware that any maker prepares a collodion especially suited to the purpose, but should think that most good samples of plain collodion might be employed. It is probable that the bromized collodion might be kept ready for use, and the requisite amount of silver added when required. If highly rectified solvents were employed in preparing the collodion, silver might be

used in the form of a saturated aqueous solution, one ounce of nitrate of silver dissolved in one ounce of water. 2. The so-called moonlight scenes produced by photography are generally instantaneous pictures by sunlight, kept in a low tone. Mr. Breese states that he has absolutely photographed a white statue by the light of the moon with a long exposure.

X. Q. P.—The complete picture, and not every separate negative from which it was produced, will need to be registered. You may describe it as you mention, and register it as one picture. The smaller copy of it will not need registration. It is the design you protect, and not the especial size in which it is produced. A copy in any size, without your permission, will be a piracy.

J. L.—By proper precautions a wet plate may be kept a couple of hours between preparation and development. By Mr. Blanchard's method, recently described in our pages, he has succeeded in keeping a plate longer than that. But although a plate may be kept that time, it would be difficult to keep foliage still for half of that time; and unless the attempt were made in a light unfit for the work, or with imperfect appliances, foliage should never need anything like such an exposure by the wet process. You are probably right on the personal question; but it is better let alone.

R. M. T.—The turbidity and precipitate formed in your collodion on the addition of more bromide of cadmium was probably bromide of potassium, which is very sparingly soluble in ether and alcohol. When a collodion is iodized with a potassium salt, the addition of bromide of cadmium will frequently form bromide of potassium, which, if in greater proportion than about half a grain to an ounce, will generally precipitate. After the collodion is settled it is better to pour off the clear portion than to filter. The collodion so prepared will probably give you great vigour and brilliancy, but a little less harmony than one containing more bromine. 2. The more bromide present in your collodion, the more nitric acid you may have in the bath, without loss of sensitiveness.

OUT-OF-FOCUS.—In your description of your studio you have left all the dimensions blank, and so left us in ignorance of a great part of what you intended to state. Judging, however, from the portraits and from the view of your studio, you are suffering from insufficient light. It seems that you are so closed in that scarcely any direct light can reach your sitters. To satisfy yourself of this, place yourself in the position of the person standing for a portrait, and then look up and around, and ascertain how much sky you can see, for that will enable you to estimate how much direct light from the sky reaches your sitter. We fancy that you will see very little. The staining of the interior woodwork is not a matter of much moment. After two o'clock in the afternoon of this season the light is fast waning, and under the best of circumstances the light at that time would not be very good. We cannot give you any opinion of the lenses; they may be good, but those of most French makers, being cheap, are a little uncertain.

VARNISH is disposed to have a good-natured laugh at Dr. Mann for regretting the loss of negatives by the adhesion of the paper to the varnished film when exposed to the roasting in the direct solar rays of South Africa. Certainly the test was a severe one, but one which, we fancy, a thoroughly good varnish made of lac would stand without becoming sticky. Many varnishes in the market will not stand the direct solar rays of our own temperate climate.

STILL.—The disagreeable smell emitted on first using your tin distilling apparatus arises from the oil and resin used in the manufacture of the tin plate and in soldering the joints. It is not wise to employ soda for removing them, since this alkali attacks the coating of tin, and renders the metal afterwards liable to rust. It is a common practice to boil a little bran with the first water in new tin saucepans; but we should advise the rejection of the first few gallons which come over, and rely upon ordinary use as the best means of thoroughly purifying the apparatus from such adventitious matters. The cost of a 2-gallon tin still and condenser may be quoted at a guinea, or rather more, according to the substance of the metal.

VENATOR.—Thanks for a sight of the box. It appears admirably adapted to the conveyance of plates of various sizes. It would not pay you to protect it in any way, but you might show it to some dealer, and arrange with him to make it.

GERMANICUS (Bangalore).—Your interesting letter, enclosure, and photographs duly received. We will examine the prints and reply in detail shortly. The NEWS, &c., shall be duly forwarded.

G. LEWIS.—Our fourth volume is unfortunately quite out of print. We are glad that you find our Art Lessons profitable.

C. R. LOBB.—Thanks. We shall make use of your suggestions in our next. The prints are good and interesting.

J. S. (Glasgow).—We will ascertain, and communicate with you.

A. B. C.—We should think it quite safe.

J. B. N.—Thanks. Answer in our next.

Several Correspondents in our next. Several articles in type are compelled to stand over until our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 501.—April 9, 1868.

CONTENTS.

	PAGE
Sulphur Compounds in Mounting-Boards	169
Photography and Disease.....	170
Loss of Sensitiveness in Dry Plates.....	170
Egg-Albumen, from a Chemical Point of View. By John Spiller, F.C.S.....	170
The New Photometer. By Dr. Vogel.....	171
Pictorial Effect in Photography. By H. P. Robinson.....	173
Adhesive Mediums: A Word or Two in Favour of Paste. By a Practical Man	174
Out-door Photography. By J. R. Heaton	175

	PAGE
On the Cause of Deterioration of Prints Mounted on Cardboard with Gilt Borders. By MM. Davanne and Fordos	176
Carbon Printing. By M. Carey Lea	176
Theoretical and Practical Photography. By Homer Fellows ...	177
Proceedings of Societies—French Photographic Society—North London Photographic Association.....	178
Correspondence—Photography and Archaeology—Keeping Properties of Tannin Plates—Cleaning Varnished Plates.....	178
Talk in the Studio	179
To Correspondents.....	180
Photographs Registered	180

SULPHUR COMPOUNDS IN MOUNTING-BOARDS.

THE presence of hyposulphite of soda in the cards used for mounting photographs has been repeatedly noticed as a source of fading; but the extent of the mischief arising from this source, it is to be feared, is not realized by photographers generally. The number of instances which have recently come under our attention in which disastrous discolouration and fading in prints was directly traceable to this cause induces us to offer a few further remarks on the subject, with a view to urge upon our readers a more careful examination of the cards upon which valuable photographs are mounted.

Mr. England recently called our attention to a curious and annoying illustration of the injurious influence of the mounting card. Of a series of his Swiss stereo views, produced and printed some years ago, some were divided and mounted on white cards, the prints being four inches by three; whilst those intended for stereoscopic slides were mounted in the usual manner on yellow enamelled cards. Having occasion recently to examine some of the small single views which had been packed away, he found, to his surprise and chagrin, that they all showed unmistakable signs of fading, especially noticeable in the yellowness of the whites and lighter tones in the skies. On examination of the stereoslides produced at the same time, on the same paper, with the same solutions, from the same negatives, mounted at the same time and in the same manner, and kept in the same place, he found that these were in perfect condition, showing no signs of fading whatever. Every circumstance in relation to the fading and the perfect prints was precisely the same, except the kind of mounting card used. The stereo slides, as we have said, were mounted on the yellow enamelled cards commonly used for that purpose, and the single prints on white cardboard of apparently good quality. On testing the latter, the unquestionable presence of hyposulphite of soda was manifest, although in much less proportion than in many samples we have examined.

It is noteworthy that it is in the whites of the picture that the action of sulphur was most decidedly manifest. In some cases the blacks were vigorous, fresh, and perfect in colour, suggesting that the trace of un-reduced silver in combination with the albumen, not removed by the action of the fixing bath, was most readily acted upon by the sulphur compound in the card, whilst the blacks formed by a thicker layer of reduced silver and gold remained unchanged.

Where the hyposulphite or other sulphur compound is present in larger quantities, however, all portions of a print readily show its action. We have, on several recent occasions, had mounted prints sent for examination, in which, within a few weeks after mounting, the whole of the image was changed, the whites having assumed the well known

unpleasant yellow tint, and the blacks the greenish brown or olive tint common to the silver print in an advanced stage of sulphurization. In all these cases the plentiful presence of a sulphur compound was readily detected.

We use the term sulphur compound in the cards, instead of hyposulphite, as answerable for this disastrous action, because, whilst the evil is most commonly traceable to the latter salt, it is not the only substance used in the manufacture of paper and mounting cards capable of exercising the injurious action to which we refer. In order to secure the pure cold white, or white inclining to blue, of some papers, ultramarine is added to the pulp in the process of manufacture, and as this substance contains sulphide of sodium, its presence is dangerous in a paper or card intended for any photographic use in which it can come into contact with the salts of silver.

The simplest test which the photographer can employ to ascertain the fitness of a mounting card for photographic purposes will indicate the presence of either of the sulphur compounds to which we have referred. In the majority of instances of unsuitable cards which have come under our notice the application of a drop of a 10-grain solution of nitrate of silver is followed immediately by the appearance of a brown stain, which should lead to the unhesitating rejection of the card. In some cases no stain is produced immediately, but if the card be moistened with the silver solution and put away in the dark for a quarter of an hour, after which time the yellow brown stain will indicate the action of sulphur if present. Another mode of using the same test, involving a little more trouble, but more satisfactory when a small portion only of the hyposulphite is present, consists in soaking the suspected card in water for a few hours, and then adding to the water, in a test tube, a few drops of the silver solution, the appearance of the brown discolouration indicating the presence of hyposulphite. The only circumstance which would be likely to render the use of nitrate of silver doubtful in detecting the presence of a sulphur compound would be the presence of caustic lime, which is, we believe, used at times in manufacturing paper, to give fictitious substance and weight. This, by producing oxide of silver, would also cause brown discolouration, but the error would be of little importance in a practical sense, since it would only lead to the rejection of a card of very doubtful fitness for mounting photographs.

Where the photographer is desirous of employing a more delicate test for the presence of hyposulphite, nothing can be more simple and accurate than iodine for the purpose. Make a solution as follows: iodine one grain, iodide of potassium two grains, dissolved in distilled water one pint. Add a few drops of this, sufficient to give a delicate blue tint to a very dilute solution of arrowroot, and fill two test tubes with the pale blue solution. To one of these add a little of the water in which the suspected card has been

soaked, and add an equal amount of pure water to dilute the iodine and starch solution in the other tube. This will permit an accurate examination of the change effected by hyposulphite if present in the water in which the card has been immersed. Hyposulphite of soda will quickly remove the blue tint of the solution to which it is added by combining with the iodine; and any degree of change will be readily observed by comparison with the other tube held by its side as a standard.

To ascertain if ultramarine is present in the mounting card another mode of testing is necessary. Ultramarine, being a furnace product, is indestructible by fire. The suspected paper or cardboard to be examined should be reduced to a charred mass by burning in the air, and then introduced into a crucible and further heated until all the carbon is consumed. If the ultramarine is not already visible in the ash by its colour, the blue particles should be sought for with the aid of a lens or microscope. A characteristic property of ultramarine is the change in colour from blue to white, accompanied by the evolution of sulphuretted hydrogen when moistened with an acid.

The photographer has, of course, no control over the manufacture of mounting-boards, but he can exercise a power of selection and rejection; and the facts which have repeatedly come under our attention point to the importance of doing so. Of late, the increase in the consumption of hyposulphites as "antichlor" in paper making is stated to have advanced in enormous ratio. It is probable that if the protest of photographers against its use in the papers and cards to be used in photography were made sufficiently loud and urgent to be heard and understood by paper manufacturers, that other substances would for their purposes be employed. Sulphite of soda, or of lime, for instance, would absorb chlorine with formation of sulphates of these bases, which would be harmless. That of lime is occasionally used, we believe, in giving whiteness to paper, and its presence might be regarded as in no wise injurious to the photograph.

PHOTOGRAPHY AND DISEASE.

MR. CAREY LEA, commenting in the *Philadelphia Photographer* on the recent communications in our pages on this subject, considers the question is so important that if an article were written monthly on this subject it would scarcely be too much. He remarks:—

"It is not in the least difficult to explain loss of health as occasioned by photographic pursuits. All physicians know that the proper ventilation of the blood through the lungs is one of the most indispensable conditions of health, and that continued exposure to vapours not in themselves usually considered poisonous produces most injurious effects. Such vapours are, for example, fumes of ammonia, or of carbonate of ammonia, vapour of acetic acid, fumes of alcohol, or of benzene. The vapours of ether and of nitric acid are now too generally recognized as poisonous to render it necessary to say much about them, and any one exposing himself to their influence must necessarily expect to suffer."

"In a word, the lungs were made for inhaling pure air, and when they are compelled to take in chemical vapours, the load the system has to carry is just in proportion to the extent to which the air is vitiated."

"It is so difficult to produce an impression in these respects, that if an article were written monthly on this subject it would scarcely be too much. But just at present is the moment when caution is most needed. In the spring and autumn there are periods when the weather is too warm for fires and too cool to work with open windows. At such seasons, rooms have unusually little ventilation; in winter the fire keeps up circulation, and in summer open windows maintain a draft. At the intermediate period there is more than usual evil from vitiated air, and unusual caution in avoiding its deterioration is called for."

"Therefore, the photographer at such times should rather maintain his fires, and keep the temperature down by opening windows freely. In fact, the safety of the photographer will always largely depend on habituating himself to a constant movement of air."

LOSS OF SENSITIVENESS IN DRY PLATES.

PROFESSOR TOWLER, in recording the results of some comparative trials of dry plates, states his conviction that most dry plates lose sensitiveness by keeping. The plates tested were prepared by England's modification of the collodio-albumen process, by Col. Baratti's coffee process, and Bartholomew's morphine process. The experiments were tried in winter, the exposures made in a good diffused light the day after the plates were prepared. All the plates, having been exposed for the same time with the same lens and under all the same circumstances, were developed with a nitro-gelatin iron solution. The morphine plate could not be brought to the proper intensity without pyrogalllic acid. Upon the whole, he states, that of the three, the coffee plate was the softest, cleanest, and best negative.

After the lapse of another day he exposed three other plates; but the time of exposure had to be lengthened for all of them by two or three minutes. The results with albumen and coffee were in this case about equal. The morphine plate is stated to have come out just as rapidly as the other two, but stopped short in the development as before, and pyrogalllic acid and silver had to be used again.

On the third day the exposure had to be twelve minutes for each plate; with less time the impression was feeble. For several days the experiments were continued, and during the whole time they had to make a like increase in the time of exposure, in order to get tolerable results. As time progressed, coffee began gradually to fail.

On the eighth day a pair of each of the three plates were exposed for twenty minutes: the albumen plates gave results clear and distinct, but under-exposed; whilst from the others the pictures could not be forced into anything worth keeping: they are described as "complete failures."

Professor Towler concludes:—"None of these plates can be said to retain their sensitiveness beyond a few days; and, in a practical way, I would not think of trusting them beyond the second day. I believe they owe their sensitiveness to a retention of moisture in the film, and not to any preservative with which they are imbued. The albumen plates preserve their working powers the longest. The coffee plates are easily prepared, and, when used the next day, are reliable, and produce excellent results. I do not like the morphine plates, although they are very sensitive soon after preparation—you cannot force the pictures easily. Of course I have reference in these observations to the peculiar mode of development; my aim is to develop both wet and dry plates with the same developer (protosulphate of iron)."

EGG-ALBUMEN, FROM A CHEMICAL POINT OF VIEW.

BY JOHN SPILLER, F.C.S.

On a recent occasion it has been proposed to employ the white of egg in a naturally moist condition as the standard of comparison in estimating the quality, or degree of impurity, of potable waters, as regards their nitrogenous organic constituents. Variations in the amount of nitrogen contained in the white of egg have, however, been admitted, and the proportion of water, or, in other words, the weight of dry albumen, is suspected to be subject to variation. Whilst engaged in some experiments upon this new method of water analysis, in which, as I have said, albumen is taken as the starting point, and its nitrogen (or a known fraction of it) is evolved and estimated in the form of ammonia, it

appeared to me desirable at once to ascertain whether or not the moist contents of the egg lost water by evaporation through the calcareous shell; for if this be the case to any appreciable extent, the constitution of the albumen within cannot possibly remain for any length of time fixed and definite, although the egg itself may, during this period, be perfectly preserved from organic decomposition.

My affirmative anticipations on this point were based upon the circumstance that a new-laid egg exhibits no cavity on breaking the shell, whilst a stale one always contains a considerable air-space; however, to set the question at rest, I made the following experiments:—The weight of a hen's egg was exactly taken, and it was then supported upon a wire tripod-stand, so that the air might have free access to the whole external surface of the shell. Upon weighing the egg after an interval of twenty-four hours it had lost exactly one grain, and this ratio of loss by evaporation remained tolerably constant during several days. As, however, the experiment was made in the winter time, and during a season of wet weather, I repeated it under somewhat modified conditions. Two new-laid eggs of large size were taken, and, after their weights had been accurately determined, they were supported in a similar manner within a bell-jar, resting on a flat glass plate, with a dish of concentrated sulphuric acid to absorb the water given out by the eggs. The whole arrangement (that is to say, the dessicator and its contents) was placed in a room the temperature of which was maintained pretty uniformly between 55° and 60° Fah., and there left for six weeks, the diminution of weight being frequently observed during this interval. In all, ten weighings were taken, and the results proved that 100 grains, or more, of water can be abstracted under these circumstances, whilst the loss in the intermediate periods followed a diminishing scale, but nearly coincided with the several intervals of time. The average loss of water by evaporation through the shell may be stated, for the two eggs operated upon, to have been at the rate of 2 and 2½ grains respectively per diem. Upon breaking the eggs at the end of six weeks, one was found perfectly sweet and good, with the envelope of the yolk unbroken, but the second and smaller one was discoloured next the shell, and the albumen had become slightly decomposed. The last results with this egg were consequently disregarded.

The details of the experiments are quoted, for they serve to show the proportion of yolk to white at the final stage; ratio of water evaporated to total liquid contents; and the exact weight, in each instance, of the shell with its lining membrane, after careful washing with dilute ammonia and subsequent drying in the air:—

Egg—No. 1.			
Original weight (entire) ...	...	975.0	grains
Loss of weight in six weeks (water) ...	...	100.0	"
Shell and membrane ...	...	99.2	"
Yolk ...	...	317.2	"
White (by difference) ...	...	458.8	"

Egg—No. 2.			
Original weight (entire) ...	...	930.6	grains
Loss of weight in three weeks (water) ...	...	41.6	"
Shell and membrane ...	...	85.2	"
Yolk and white ...	...	803.8	"

It will here be noticed as an anomaly that the heavier shell of No. 1 egg permitted a faster rate of evaporation through its substance than No. 2. The latter appeared, however, upon inspection, to have a smoother external surface, and to be stronger and more compact in structure throughout.

The following table shows the actual amount of water lost by evaporation in the two instances for the intervals of time specified in the first column.

Loss of Weight in Dessicator (Water evaporated).			
Intervals of time.	No. 1 Egg.	No. 2 Egg.	
Days.	Grains.	Grains.	
1 ...	3.4 ...	2.6 ...	
2 ...	6.9 ...	4.7 ...	

Intervals of Time.	No. 1 Egg.	No. 2 Egg.
Days.	Grains.	Grains.
7 ...	17.3 ...	14.0 ...
14 ...	34.3 ...	27.6 ...
21 ...	51.1 ...	41.6 ...
42 ...	100.0 ...	— ...

Ratio of Water Evaporated to Total Liquid Contents of the Egg (per cent.).

Time.	No. 1.	No. 2.
In two weeks ...	3.9 ...	3.3 ...
three " ...	5.8 ...	4.9 ...
six " ...	11.4 ...	— ...

It would be difficult to prove whether or not the water lost by evaporation from the white is partly compensated by an accession of water, by diffusion, from the yolk. No colouring matter travels outwards unless an organic decomposition sets in, when all the natural barriers are destroyed, and the several parts of the egg become merged. I am inclined to think that this re-distribution of water actually occurs, since the *sac* of the yolk appears wrinkled in a stale egg, as though by loss of a portion of its liquid contents.

The composition of fresh egg-albumen may be said to vary between the following limits:—

Water ... 88 to 85 per cent.

Dry albumen (containing nitrogen 1.55 to 1.75 per cent.) ... 12 to 15 "

Other analyses have been recently published, in which the nitrogen amounts to 1.81 per cent. and upwards, with the minimum proportion of water. It is probable that these latter results were obtained with eggs which had been longer kept in stock.

The indications of change in the composition of egg-albumen by evaporation of moisture are not, perhaps, so decisive as to interfere greatly with the ordinary operations followed in the manufacture of albuminized paper; the protracted exposure of large surfaces of diluted albumen in shallow dishes left freely open to the atmosphere of heated rooms must induce a more rapid increase in concentration of the albumen than is ever likely to occur as the result of the natural dessication of the egg. The relation subsisting between the yolk and white in different eggs appears to vary between somewhat wide limits; and the most remarkable monstrosity that ever came under my notice was a double egg, united at the smaller extremities by a membranous ligature, and without any shell; the one *sac* containing all the yolk, and the other only the white. This was laid by a hen belonging to a member of our staff, and we have had it since August, 1866, preserved in spirit. It lost water rapidly during the short interval previous to immersion, and the yolk half seemed from the first to be less expanded than the twin *sac*. From the circumstance that it remained so in any position we inferred that there was no communication between the two receptacles. It should be mentioned, in conclusion, that these latter were of the ordinary size. I send you a stereo photograph of this interesting object.

THE NEW PHOTOMETER.

BY DR. VOGEL.

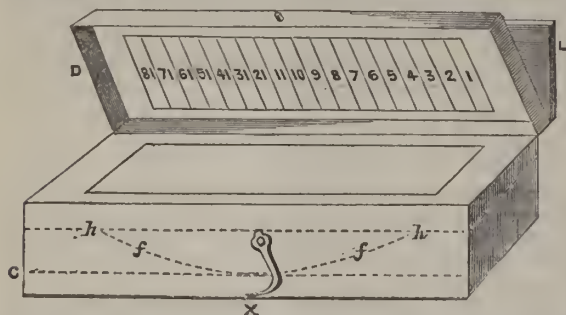
My new photometer is intended for measuring the time of exposure for negatives in all the photographic processes in which the image is not obtained by direct operation, but is brought out afterwards by a development; such processes, for instance, as the carbon printing process (one of the most important applications of the instrument), enamel process, aniline printing process, photo-lithography, for the production of negatives, &c.

The photometer consists in a transparent scale, made from a prepared paper, graduated in strips, the thickness increasing in an exact mathematical proportion from one end to the other. Under this scale is exposed a strip of bichromated paper—Saxe paper, immersed in a 1:30 solution of bichromate of potassium for two minutes, and dried afterwards. This

paper keeps its qualities very well for some weeks, and is as sensitive as silver paper, and it is darkened by the light to a tint deep enough for photometrical purposes.

If such a strip of bichromated paper be exposed under the transparent scale, the strip is darkened by the light, at first under the thin end of the scale, and this colouration will advance to the thick end of the scale, in ratio corresponding with the actinic quality of the light. For recognizing exactly the point to which the action of light is advanced, numbers are printed on the transparent scales in opaque ink, which retards the action of light, and causes the numbers to appear white on the sensitive paper.

The instrument is like a printing-frame, but with an arrangement to open it from the glass side for observing the number made visible by light on the bichromate paper. The bichromate paper is cut in strips corresponding with the length of the inner case C, which is, for placing in the strips, opened from the lower part; the dotted piece of wood, *h*, is re-



moved, and the sensitive strips are laid one on the other in the case, which is then closed. In this manner the paper strips are pressed by the elastic (dotted) spring *f* against the upper side (open in the figure), and if the cover *D* is closed (by aid of the catch *x*), the strips are pressed against the transparent graduated scale. This scale is fixed on a glass strip which forms the upper part of the cover *D*. A second cover, *L*, of wood, serves for exposing the transparent scale to the light when it is necessary to make an observation or examine the bichromate strips by lamp-light.

For employment in carbon printing, this photometer is brought to the light at the same time as the printing-frame with the negative, which is allowed to remain exposed till the instrument indicates 10, 12, 14 degrees, according to the thickness of the negative and the sensitiveness of the carbon paper (16° in employing Swan's paper for a medium negative).

The method employed for fixing upon the number of degrees requisite for printing any negative is very simple. My own negatives I can at once, on inspection, divide into three classes, viz., thick, thin, and medium; and in order to fix the degree of intensity I take a carte-de-visite negative containing three or four pictures of equal density, and expose it to the action of light with a piece of carbon paper. When the photometer, which is exposed at the same time, indicates 10°, I cover up one of the pictures; at 12° I cover a second; and at 14° a third. Whichever degree of intensity gives the best picture on development is the one best suited for the negative under examination, and others of a similar thickness. To ascertain the printing degree in other negatives I proceed in the same manner, a small strip of sensitized paper only being required for each experiment, just sufficient to cover a thin section of the negative. When the degree of a negative has been fixed upon, I mark the latter with the number. A little experience in the use of the photometer and the carbon process will enable the operator to ascertain the requisite degree of any negative by simple inspection; and when this has been ascertained, the process is very much simplified, for, as Wilson remarks very truly, "if the exposure is correct, the print cannot fail to be a success."

It may be supposed that one photometer is required for

every copying-frame; this is, however, by no means necessary, if a systematic method of working be adopted. A number of frames are furnished with sensitized paper, and brought into the light at the same time, together with a photometer; and when the instrument indicates the degree of intensity necessary for the printing of the thin negatives, the latter are either turned over or removed, the thicker negatives being treated in the same manner when the photometer indicates that they have also been sufficiently exposed. In favourable weather the whole batch will be printed in a few minutes, and attention must therefore be paid to the photometer, in order that the negatives may be covered up at the proper time. As many as ten prints may sometimes be obtained from a thin negative in one hour. If the prints are required in a hurry, and it is necessary that no times should be lost in the printing, it is as well to have one photometer for each of the three descriptions of negatives (viz., for the thick, thin, and medium); but even by this arrangement only three instruments are necessary.

There is one more point still to be considered, and that is, the sensitiveness of the carbon paper, which differs greatly according to its manufacture, that exported from America being almost double as sensitive as that made in England. To ascertain the sensitiveness of a new paper, it is necessary to make an experiment, in the manner above described, with a negative of which you already know the printing degree. For instance, if, with American paper, a negative is known to have the printing degree of 10, and with the new paper the degree is found to be 12, then the degrees for all other negatives must be added when printing with the new paper.

The reason of this simple calculation is, that the degrees of transparencies of the scale are in an exact mathematical proportion, the proof of which I will give to you as shortly as possible.

Imagine a series of transparent strips of absolutely the same quality—for instance, mica, glass, paper, &c.: if the light goes through a series of such strips, its intensity is diminished by reflection and absorption. This diminution will be the greater if the number of strips is larger. Suppose the intensity of light which falls upon the upper strip will be = 1, and the diminution by going through one strip is such that the original intensity is reduced to $\frac{1}{n}$, then the

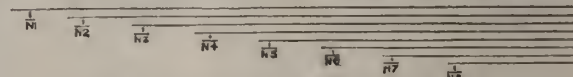
diminution will be, after gone through—

$$\text{the second strip} = \frac{1}{n} \times \frac{1}{n} = \frac{1}{n^2};$$

$$\text{the third strip} = \frac{1}{n^2} \times \frac{1}{n} = \frac{1}{n^3};$$

$$\text{the fourth strip} = \frac{1}{n^3} \times \frac{1}{n} = \frac{1}{n^4};$$

therefore, if you construct a layer of strips like a staircase,



the intensity of light after gone through will be—

1	2	3	4	5	6	...	...	9 strips
$\frac{1}{n}$	$\frac{1}{n^2}$	$\frac{1}{n^3}$	$\frac{1}{n^4}$	$\frac{1}{n^5}$	$\frac{1}{n^6}$	...	...	$\frac{1}{n^9}$

that is, the intensities of light gone through such a layer of strips form a geometrical series.

Now, if the intensity of light is reduced in such a manner whilst going through the strips, it is very easy to conceive that the quantity of chemical (actinic) light which must fall upon the layer of strips for making a visible impression on chromate paper, which is situated under the strip, must be larger in the same proportion as it is reduced whilst going through the strips. It is demonstrated that the diminutions are in the proportions—

$$\frac{1}{n} : \frac{1}{n^2} : \frac{1}{n^3} : \frac{1}{n^4} : \frac{1}{n^5} : \frac{1}{n^6} \dots \dots \frac{1}{n^9}$$

therefore, the quantities of actinic light necessary for making a visible impression under one, two, three, . . . 9 strips, will be—

$$n, n^2, n^3, n^4, n^5, n^6 \dots \dots n^9;$$

that is, the quantities of light indicated by the appearance of the degrees of the photometer form a geometrical series, of which the numbers of degrees are the exponents.

From this law you now make a very important conclusion for practice; for you receive a new paper with another degree of sensitiveness. You have not necessarily to determine by long experiments the printing degrees for the new paper; but it is sufficient to make a single experiment with a single negative, in the manner before described. If the printing degree for this negative on the old paper was, for instance, = p , and for the new paper you find, for instance, the printing degree = r , then the quantities of light for printing out the same negative on old and on new paper, are in the proportion—

$$n^p \quad n^r = \frac{n^r}{n^r} = n^{(r-p)}$$

therefore, if you will make a print on the new paper it follows that you have necessarily a quantity of actinic light, which is for $n^{(r-p)}$ times larger than the quantities necessary for printing on old paper. For this reason, if the printing degree for any negative for old paper was, for instance, = v , then the quantity of actinic light necessary for printing out on old paper this negative was n^v ; and if you will make from this negative a print on new paper, you have necessary a quantity of light, which is $n^{(v-p)}$ times larger; that is, = $n^v \times n^{(r-p)} = n^{v+(r-p)}$.

Now, the exponents v r p , &c., are the numbers which I name the printing degrees; therefore, the printing degree for the negative above mentioned is = $v + r - p$, and from this follows:—

If you will have the printing degrees for any new paper, for all the negatives, from which you know already the printing degrees for an old paper, you only add the difference between the two printing degrees, determined by a single experiment with a single negative to all known printing degrees of all your negatives.

I use the instrument for carbon printing chiefly. For observing the number made visible by light a little practice is necessary. Recently I have used the instrument also in reproducing photographic enamels, with the process Obernetter or Joubert; also for making aniline prints (process Willis). A transparent glass positive gave a well exposed aniline print with 8° of my photometer; the same positive gave an image for enamelling (process Obernetter) with 15° of my photometer. This shows that the aniline printing process is much more sensitive than the Obernetter enamel process and the carbon process. For the latter, the printing degree for a medium negative on Swan's paper = 16°; on Rowell's = 11°. For photo-lithographic and similar purposes, I shall try the instrument shortly. For determining the time of exposure in producing negatives, the mode of using the instrument is a little different from the way above mentioned. Here a table is necessary, calculated by myself, which I shall publish another time.

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS. BY H. P. ROBINSON.

CHAPTER XI.

"Many are the landscape painters who seem, in their studies from nature, as if they had never raised their eyes above the horizon; and among the proofs of the indifference of those who interest themselves in art to the beauty that canopies the earth, may be noticed that, although the composition and light and shade of clouds are as much within the reach of the photographic art as any of the other great things of nature, they are her only beauties it has hitherto neglected. I have seen but two calotypes of skies, and these prove that it is from no want of power in the process that

skies are not as common in our photographic exhibitions as any other subjects."—*Leslie*.

"To admire on principle is the only way to imitate without loss of originality."—*Cotteridge*.

THE SKY.

WHEN Mr. Leslie wrote his Hand-Book for Young Painters, from which one of the above quotations is taken, very little had been done towards the photographic representation of cloudland. I shall always esteem it one of the proudest recollections of my life that I had the honour of knowing this great painter—one of the greatest England has produced. He always took great interest in our art, and it was a good deal by his kind appreciation of my earlier efforts, and encouragement against much opposition, that I persisted, whether rightly or wrongly, in my endeavours to make photography the vehicle of pictorial effect.

But this is commencing with a digression, all the more objectionable because it is personal. Dealing with this part of my subject affords me an opportunity, however, of which I avail myself as a pleasure and a duty, to record a personal knowledge of the interest taken by this great painter in the art-capacity of photography.

Since the time when the Hand-Book was written (1854) photographers have, it is true, turned their attention to the sky, but only in a fragmentary sort of way, and not with a steady determination to make the most of it in their pictures.

The importance of the sky as an aid to effect in landscape cannot be over-rated. In a letter to a friend, quoted in the work I have just mentioned, Constable, who was an enthusiastic admirer and follower of nature in his works, and who spent entire summers in painting skies, thus writes, and his observations should be taken to heart by all landscape photographers:—"That landscape painter who does not make his sky a very material part of his composition neglects to avail himself of one of his greatest aids. I have often been advised to consider my sky as 'a white sheet thrown behind the objects!' Certainly, if the sky is obtrusive, as mine are, it is bad; but if it is evaded, as mine are not, it is worse; it must, and always shall, with me, make an effectual part of the composition. It will be difficult to name a class of landscape in which the sky is not the key-note, the standard of scale, and the chief organ of sentiment. You may conceive, then, what a 'white sheet' would do for me, impressed as I am with these notions—and they cannot be erroneous. The sky is the source of light in nature, and governs everything; even our common observations on the weather of every day are altogether suggested by it. The difficulty of skies in painting is very great, both as to composition and execution; because, with all their brilliancy, they ought not to come forward, or, indeed, be hardly thought of, any more than extreme distances are; but this does not apply to phenomena, or accidental effects of sky, because they always attract particularly."

Although I do not think it advisable to make a too liberal use of quotations, I cannot forbear adding Leslie's own testimony to the value of the sky, and which contains a very beautiful thought:—"Rocks, trees, mountains, plains, and waters, are the features of a landscape, but its expression comes from above; and it is scarcely metaphorical to say nature smiles, or weeps, and is tranquil, sad, or disturbed with rage, as the atmosphere affects her. Hence the paramount importance of the sky in landscape—an importance not diminished, even when it forms but a small portion of the composition."

It often occurs that a view must be taken of a scene that composes badly, and of which, from accidents of the ground, it is impossible to select another point of view. The artistic photographer now has his remedy in the sky, and if he understands the use of it for producing pictorial effect, he may redeem the ugliness of a scene not worth photographing for itself, but which may be interesting from its associations.

The sky is the natural background of the landscape, and should be of the same use to the landscapist as a background

is to a portrait photographer, and should not be regarded as so much waste paper, as is too frequently done, but it should be made to throw out and relieve the principal subject, by the direction of the cloud lines opposing the lines of the landscape, by the opposition of light and shade, either to produce relief or breadth, and to generally assist in the production of pictorial effect: unless, indeed, as sometimes occurs—a fine sunset, for example—the sky be the chief object represented; then the landscape must be subordinate.

Leaving out of consideration the latter case, let us see how far its employment as a means of effect is legitimate, especially when printed from a separate negative to the landscape to which it is joined in the finished print: the only way, in my opinion, by which the fullest value can be obtained, and the utmost amount of pictorial effect can be produced; and that not by blind chance, of which Ruskin tells us to be independent—as would be the case if taken with the landscape—but with that certainty which a knowledge of art give to its votaries. It will not be necessary to give any definite instruction for the use of the sky, as the readers of these articles will, by this time, or after they have read the chapters on *chiaroscuro* which are to come, be able to artistically apply an object that is infinitely varied, to suit all circumstances of composition, and is for ever changing in its light and shade and form.

Many ingenious arrangements have been devised for the purpose of securing the sky on the same plate as the landscape, and I believe there are now no chemical or mechanical difficulties in securing the two by one operation which a clever photographer could not successfully combat; but before you cook your hare you must first catch it. Now, however natural any sky that may happen to be in the heavens at the time the photograph is being taken, it only occasionally occurs that it is the best, or nearly the best, for pictorial effect. This being the case, it is for the operator to select a sky that will best suit his picture; and in doing this he must have a sufficiently critical knowledge of nature, and the various phases she assumes, to prevent him departing from the truth of nature. He must keep strictly to the truth of nature—that is absolutely imperative—but he may select the best and most picturesque nature he can get. The intelligent student will be ever on the look-out for what is beautiful, and when he sees a fine effect he will always examine the causes by which it is produced, and note them in his pocket-book, although he may not have his camera with him at the time.

What the photographer has to do, then, is to select and use a probable sky to increase the beauty of his work; but it must be such a sky as would render it impossible, not only for the carping critic, but also the real man of science, to say it is not true. It must, indeed, be so true as to defy the adverse criticism, as a fact, of the most learned meteorologist. Surely no very impossible task to an observing student!

While the foreground of a picture should contain the keynote of the composition, the sky should always preserve harmonious relation to the whole picture. The various effects of cloud and sky which may be introduced in landscape photography afford a vast scope for the display of the art capacity of the operator. He can, by a well-chosen effect, bring an otherwise unimportant and somewhat tame distance into better keeping with the remainder of the picture; he can by its means supply a deficiency in some of the most important lines of the composition; or he can, especially in pictures with figures in the foreground, use an effect of cloud or atmosphere to give not only relief to the principal object, but to correct the foreground and the distance; for although the sky is really behind the picture, still it may form the connecting-link between any two grades of colour or masses of light and shade.

Just a word in my next in reference to the absurd notions of those who hold—I can scarcely say believe—that the truth of nature is violated if a sky is added to a landscape from a second negative, and that those who select nature "maintain in idea that the artist is greater than the Divine

Maker" of nature, which they quote, and pervert to an unintended use, from Ruskin, and then, as far as this part of my subject is concerned, I have done.

ADHESIVE MEDIUMS—A WORD OR TWO IN FAVOUR OF PASTE.

BY A PRACTICAL MAN.

As some little attention is now being directed to "india-rubber solution" and other adhesive mediums, a few hints may be acceptable in regard to the old domestic "familiar"—paste. Paste is considered a very simple thing to make. So it is, when you know how. Milk is a very simple thing to boil; potatoes not less simple; but how rare to find them properly prepared; the first without being allowed to boil over, and the second without being reduced to a watery smash! The general fault in paste making is in not having it sufficiently smooth and sufficiently boiled—not burnt. Pastes may be made of dextrine, rice, starch, or flour. Paste made with flour was extensively used by the old water-colour painters: Turner, Girtin, Varley, Walmsley, and others. If paste were guilty of all that is sometimes laid to its charge by photographers it could scarcely fail to injure the tints of many of the delicate water colours used by these masters in producing their charming effects. Yet their drawings in the folios and in the frames of collectors have suffered no further change than that of receiving the "golden tinge of age," a very different thing from the sickly yellow tinge of a decaying fading-away photograph. The greater part of the pictures alluded to have been in existence more than half a century, and, from their present perfect state and freshness, seem to have received but little or no harm that can be laid to the charge of "paste;" it being also a generally understood fact that Turner freely used paste to the backs of all his drawings, his fleecy cloud effects, &c., being produced on the fronts by copious washing and sponging.

To keep paste from becoming mouldy, put in a few shreds of isinglass and a little essential oil of cloves. A good serviceable paste is made by first preparing a bason or cup full of strong starch, according to quantity wanted, to be made with hot water poured from the spout of a tea-kettle with the steam well up. When the starch paste has become cold, put it into a wash-hand basin or pan, and rub well up with the hands—in fact, wash the hands in it; then return the same to the cup or basin, and put on one side to ripen. This will be known to have taken place when the paste loses its blue tinge, and becomes white. It will now be found as thick and smooth as butter, and can be spread over paper with the finger, so as to form a clean and even film. This paste may be mixed with prepared gum; one part gum to two of paste. The gum should be dissolved in clean soft water, and then strained through flannel for use.

A general mistake in the pasting process is that the paste is used too thin, and not allowed time to soak into the paper; but the moment the paste is applied down it goes, and then commences all the eel-like evolutions of twisting, turning up, and cockling. There is nothing more convenient for the photographer in pasting operations than the old "napkin press" of thirty years ago, when napkins and finger-glasses were in vogue. These presses have a drawer underneath, the bed of which is of inch-deal, on which is placed any article—napkin, book, paper, print, or cloth—that wants pressing to take out the creases and folds. A piece of board, somewhat smaller than the bed, is now placed over the articles, and the screw turned that works down from the top rail. This arrangement will allow the article to remain under pressure as long as may be needed, or till such time as they are firmly set and dry. Much of the failure attending adhesive methods and processes is more from the careless and slovenly way in which the thing is done than from the materials themselves. The addition of a few drops of the ten-grain solution of carbolic acid, as described in a

former number, will be of service in the gum and paste recommended above. A very useful and available article to keep paste, &c., in is one of the common mustard-pots that have covers fitted to them for keeping out dust and dirt. It is as well not to leave the brush in the paste, but to well wash it after using, and put by for another time.

OUT-DOOR PHOTOGRAPHY.

BY J. R. HEATON.*

As the time of the year is now fast approaching when photographers will commence active operations out of doors, I thought it would, perhaps, not be out of place to offer a few remarks on photography in the field, with a glance at the apparatus necessary for its prosecution by the wet process.

We will commence, then, with the dark tent. I have tried a variety of contrivances in the shape of boxes and tents of almost every description for the preparation and development of wet plates in the field, and I may safely say that I have found none so portable or convenient as the one now before you; it is so easily and quickly erected—not occupying more than two minutes—which I consider a very great advantage when you have to move about to so many different localities in a day. Too much attention cannot be given to see that each and every part of the apparatus is properly fitted and constructed, so that no accident may occur when in the field. I have some painful recollections of accidents which have happened during my experience in out-door work. How provoking to the ardent photographer when, after travelling miles away from home in search of the beautiful and picturesque, he at last comes upon some glorious landscape which he has often dreamt of, but never before seen realized—a wonderful combination of foliage, water, clouds, sunshine and everything that is grand and beautiful; there is not a breath of wind to disturb the most delicate blade of grass; the purest of light comes just in the right direction for giving the best effect to the scene; he is enraptured, and somewhat nervously commences operations by unpacking his tent and his chemicals—when, to his horror, he discovers that by some mysterious and extraordinary means the camera, lenses, plates, &c., are completely inundated. The screws of his water-tight bath have failed to perform the office assigned to them, consequently the nitrate solution has free access to the box and everything it contained: perhaps the glass dipper is broken, or the loose handle for focussing has been left behind, or lost, and you are thus debarred from proceeding any further until things are rectified, which is not always an easy matter when away from home. As Richard the Third, you might with propriety exclaim, “A screw! a screw! my kingdom for a screw!” It is a good plan, in fitting out an equipment, to provide a separate place for every article required, so that if there be any vacant places visible, the deficiencies can be at once filled up; and if there be any doubts whatever respecting the working qualities of either apparatus or chemicals, by all means try a plate before venturing away from home. It may save you from much useless labour, expense, and consequent mortification.

As to cameras, I think that for ordinary out-door operations there is nothing superseded the binocular form with bellows body, rising front, swing back, hinged focussing-screen, and moveable central partition. In the camera before you—which I may here state is made by Mr. Rogerson, of Manchester—you will observe that with this camera long or short focus lenses can be used at will according to circumstances or requirements, which is sometimes a great advantage, especially when working in confined situations. The focussing is effected by means of a rack-and-pinion; it is more convenient to work, besides saving the extra expense in having a rack-and-pinion to every lens you use. You will also observe that it can be used either in a vertical or horizontal position, and that (unlike any camera I have

seen before) the rising front and swing back movements are available in both cases. It is constructed for plates $7\frac{1}{2}$ by 5, and is suitable for a variety of work. It may be used both in the studio and the field, taking pictures the full size of the plate for stereo slides and cartes, the length of the plate enabling the operator to cut his carte prints either horizontally or vertically, whichever best suits the picture. He has also considerable latitude for stereos. One half the size of plate comes in very handy for book illustrations and for magic lantern slides. Another advantage is that, having only one size of plate, you only require one size of bath, plate-box, printing-frames, &c. As a rule, the tripods generally used for out-door photography are too low. I think that to give the best effect in most cases the camera should stand (say) from 5 feet 6 inches to 6 feet in height, which would be about the same level as is generally seen by the ordinary observer of nature. A longer tripod is very useful when you wish to operate over a wall or fence, or to plant in a stream or brook, as is sometimes necessary.

The landscape photographer should, if possible, provide himself with a number of lenses of different focal lengths, and have them ready for use as circumstances and occasion would suggest.

I think it would be unwise for me to recommend any particular formula for the production of negatives in the field, as so much depends upon the description of subject you may have in hand. You may wish to take a distant landscape, a group of cattle, a study of foliage, ferns or grasses; or, may be, an architectural subject; perhaps, a river scene, or a waterfall. And then, again, much depends upon the light, the temperature, and other things combined together, that I should consider it a piece of folly to recommend one particular formula or mode of working for anything and everything you may come across. Of course every photographer knows—or, at least, ought to know—the value and importance of keeping his chemicals in the best working condition possible. And should he have any particular formula or method of manipulating wet plates with proficiency and certainty, let him stick to it, and not allow himself to be led or carried away by the numberless formulas, processes, and their modifications, that are continually emanating from various sources. There are collodions, baths, developers, and in abundance; some collodions that are said never to fail in giving the best results, even in the worst of weather. Collodion is now manufactured for producing portraits *a la Salomon*. There are baths which never get out of order; and I have seen some that, judging from the plates which come from them, never were in order. There are developers of all descriptions and strengths, varying from 2 or 3 grains to nearly 100 grains to the ounce; some that both develop and intensify in one operation, and some that bring out nothing but fog, streaks, stains, spots, and dissatisfaction. There are processes and formulas enough to perplex and bewilder all who will go to the trouble and expense of trying them. It does not necessarily follow that because Mr. A. develops his negatives with a gelatine solution, and gets such beautiful results, that I, or anyone else, using the same developer, shall produce exactly the same, or even similar pictures; it is the knowledge of seeing and knowing what we most require, and adapting the same to our requirements. Why should every subject we operate upon receive the same mechanical treatment? The photographer should always have two or more samples of collodion of different characters, one giving a good creamy film, the other a thin one; these can be used in their original state, or mixed together, to suit any particular subject. A small bottle containing a concentrated solution of iron is also a very valuable acquisition for strengthening the ordinary developer, now and then, as occasion requires.

The facility of successfully developing a picture is one that requires a considerable amount of experience, as a negative is so very easily spoiled by under or over-development. In taking a landscape embracing some ten or twelve miles of scenery, the extreme distance being composed of mountains

* Read before the Oldham Photographic Society, March 29th.

and clouds, in the middle distance we have a sheet of water, while the immediate foreground is made up of some dark objects, rocks, foliage, &c. If we expose a plate on this subject in the ordinary way, we shall probably find, on developing, that while the mountains and clouds in the distance are much over-exposed, the foreground has not been exposed sufficiently long to bring out any detail whatever beyond a general outline. There are two or three methods of remedying this evil: one is effected by means of a flap-shutter, which is fixed either inside the camera or in front of the lens. By these means the operator has sufficient control over his subject; whilst securing detail in the foreground, he does not sacrifice anything in the other parts of the picture, but all are harmoniously combined together.

Much can also be done by the judicious application of the developer, keeping the same more on the foreground, whilst the development of distance, clouds, &c. are held in check; then, again, in the printing, by skilfully masking the different parts of the negative that would otherwise become too dark.

Every landscape photographer should be in possession of a number of cloud negatives of different characters, so that he may always be able to introduce suitable skies in his pictures: they will be found very serviceable when printing from negatives which give white skies. Perhaps I shall have something to say on double-printing at some other time.

I shall not attempt to lay down any rules for selecting, arranging, and composing the landscape; but I would take this opportunity of recommending to all who take any interest in picture-making to read and study the excellent papers by Mr. H. P. Robinson, now being published in the PHOTOGRAPHIC NEWS. And, in conclusion, let me impress upon the minds of all present, who have not made a knowledge of art their study, to lose no time in cultivating it; and let each and every member strive to encourage, assist, and stimulate each other, and may we all endeavour to produce something worthy and more creditable both to ourselves, our art, and the Oldham Photographic Society.

ON THE CAUSE OF DETERIORATION OF PRINTS MOUNTED ON CARDBOARD WITH GILT BORDERS.

BY MM. DAVANNE AND FORDOS.*

IN December last we communicated to the Society a few remarks on the appearance of certain spots upon carte-de-visite photographs, a cause of deterioration which was seldom met with on pictures of a larger description. These spots were of the most minute kind, and always became visible, in greater or less numbers, a short time after the pictures had been mounted. The cause of this alteration in the photographs was due, we opined, to the presence of metallic powder in small quantities upon the surface of the card-mount; having now completed a series of careful investigations in reference to the subject, we are now able to state positively that such is the case.

Our labours have been greatly facilitated by the kind assistance of our colleagues, who, readily responding to our call, have furnished us with information and subjects for examination. M. Dauvois procured for us samples of the different descriptions of powder used in gilding and ornamenting card-mounts, and MM. Quéval, Reutlinger, Cognac, and Jacoby, have forwarded examples of damaged pictures.

The injury is due, as we have before stated, solely to the presence of minute particles of metal which become attached to and attack the picture; it being unnecessary that the metallic powder should be mixed with any sulphurous compound. M. Quéval has furnished undisputed proof of this being the case by forwarding a few stereoscopic slides in which a perceptible line of these spots may be traced on the prints in those parts where a line of bronze is printed

underneath; a microscopical examination of spots of a similar character on carte photographs showed them to be due to the same cause.

If a little bronze powder is strewn over a piece of cardboard, even of the smoothest description, and then dusted off again, there remain in the pores of the cardboard small particles of bronze, which, although invisible to the naked eye, are very apparent with the aid of a microscope. A print mounted upon a card of this description soon becomes speckled, and the little spots, which appear white upon the surface, will be found to have a little black germ below, if the print is raised up by means of a needle point. The operations of mounting and rolling are often sufficient to remove a little of the powder from the bronze ornamental line round the picture; and these particles, becoming adherent to the surface of the print, likewise produce spots, but in this case the black germ will be found to be uppermost, and becomes visible immediately.

M. Jacoby forwarded to us carte pictures presenting the same obnoxious appearance, but mounted on cards not with gilt, but with red borders. We at first imagined that the ink used for these borders contained vermilion or sulphide of mercury, and that this was the cause of deterioration; the spots, however, were due, as in the other cases, to particles of metallic powder which must have become deposited on the prints during their sojourn in the *atelier*, or during their manipulation with the rolling-press (which had previously been used in finishing off pictures with gold borders); for an examination of the spots with the microscope betrayed the presence of minute particles of bronze not yet decomposed. A little dust collected in the *atelier* where the pictures were produced was found to contain a large quantity of these metallic particles.

The largest and best proof remains to be mentioned: a small quantity of bronze powder was strewn over a picture, and its action was then closely watched in a damp atmosphere. After a short time each metallic particle was found to have changed into a black speck, and to have become surrounded by a white halo presenting all the characteristics of the spots which form the subject of the present examination.

The explanation of the formation of these spots is very simple when we remember that the photographic image is composed, according to the researches of MM. Davanne and Girard, of metallic silver and an argento-organic compound, which forms the colouration of the picture. It is this argento-organic compound that is destroyed by the metallic particles, which exert a very rapid and intense action upon the print, especially when the latter has been insufficiently toned and washed.

CARBON PRINTING.

BY M. CAREY LEA.

ABOUT a year since I made some experiments towards the simplification of carbon printing, which I left unfinished, with the intention of returning to them at a future day; but I have not found the time, and M. Despaquis, in his experiments on mica printing, has hit upon an idea a good deal similar to that which I was working on. But my principle was of much wider application than his, so that, I believe, I may do some service in publishing it before some one takes out a patent for the idea.

It seems to me that if I could find a method of carbon printing in which the troublesome transfers could be done away with, carbon printing would be considerably simpler than silver printing, because of the absence of need of toning. This could only be done by printing through the support. I tried paper prepared in many ways (a method which Mr. Blair has long laboured at) without getting any satisfactory results, principally, I think, because the bichromate solution penetrates irregularly into the varnished or waxed paper, and renders it unequally adiacinic. Glass presented the difficulty that

* Read before the French Photographic Society. See also p. 124.

in printing a negative, through even very thin glass used as a support for the sensitized pigment, the sharpness would be very much impaired.

Glass, however, offers such very great advantages, by reason of its perfect transparency and its cheapness, that it seemed very desirable to overcome this difficulty, and I succeeded in doing so perfectly. I found that by the device which I adopted I could print a portrait through a piece of plate glass upon a carbon surface so sharply that every hair was visible. This was done by using reflected sunlight—a species of illumination which, though occasionally used in the negative process (for copying Daguerreotypes) has, I believe, never before been used for positive printing, and certainly not for the purpose here proposed, and for which it answers equally well.

The best mode of proceeding is to place the frame holding the negative and the pigmented glass against the wall, beside a window at which the sun enters. Then let a mirror be placed so that the rays fall upon it almost perpendicularly, and are reflected full upon the frame. The sensitiveness of the bichromate is so much greater than that of silver paper that even in this light four or five minutes' exposure are sufficient with an easy-printing negative.

After printing, all that is necessary is simply to wash off the superfluous pigment, and the picture is finished. It is an exceedingly easy process, as will naturally appear from my description, and, what is no small matter in these days, can be practised by any one without infringing existing patents.

Transparencies printed in this way may be looked at through the glass, and thus are non-reversed. The method is, of course, not applicable to printing on opal glass, for the support must be transparent.

I cannot doubt that, with the aid of this plan of using reflected sunlight, modes will be found of working upon transparent paper, such as will give good results. All pictures on pigment, made without transferring, must in every case be reversed. If it is necessary to avoid this difficulty, the negative itself must be either reversed by taking it on the back of the glass in the camera, or, if made in the ordinary way, this mode of printing by reflected sunlight will enable the negative to be printed through its own glass, provided the latter is free from flaws and defects.

Obviously, however, the most useful application of this idea is to the printing upon thin plate glass, in the manner first above mentioned. Connected with this, a few words remain to be said as to the best method of preparing the glass for printing.

Of course the sensitive mixture can be poured out upon the glass. Mr. Swan, I believe, prepares all his "tissue" originally upon glass, and transfers it to paper.* But as this operation requires a special manipulation not immediately acquired, it will be found simpler to purchase the pigmented paper, and apply it to the glass. And here a difficulty will be found. The "tissue" must of course be sensitized. If dipped into the bichromate solution and applied to the glass, it will be found wholly impossible to get rid of the small air-bubbles which form between the pigment and the glass. To avoid this, put the glass first into the pan of bichromate solution, then the pigmented paper, pigment side down. Let it remain for the proper time (two or three minutes), and then lift the glass with the tissue upon it. There is not the slightest difficulty in doing this without being troubled by the appearance of a single bubble.

It is not necessary to remove the paper; it is, in fact, better to leave it on. After exposure, plunge into cold water, and after a few minutes peel off the paper. Finish with water as warm as may be found necessary.—*Philadelphia Photographer.*

* This is a mistake. Mr. Swan prepares the paper with the pigmented gelatine direct: the paper, in an endless band, being made to pass, by the revolution of the rollers on which it is stretched, repeatedly over the surface of the gelatine preparation.—*Ed. Photo. News.*

THEORETICAL AND PRACTICAL PHOTOGRAPHY.

BY HOMER FELLOWS.*

THEORY and practice are two separate and distinct principles, as opposite as the day-dreaming thinker and the busy, bustling workman; and yet they are conjoined, for the workman often alters and adapts the dreams and theories of the thinker, for his own practical purposes, that would otherwise be lost for general benefit.

This philosophical fact is evolved and proved by the consideration of two of the most important subjects that affect the photographic craft at the present time.

There is a wide-spread desire among thinking photographers to class the photographic art with the fine arts, and there is a universal wish to check the depreciation in the value of photographic labour which seems occasionally to overrun us, affrighting the timid and carrying dismay to all. The frequent reference to these two subjects in the columns of the journals is the best proof of their importance; but whether the art can be classed and considered as one of the fine arts by the practical photographer who engages in the business for a livelihood, or will be judged to be a mechanical business, to be carried on by rule and line, as it too frequently is, will probably remain an open subject for debate for some time to come, notwithstanding the frequent expositions that may be made on the subject.

Those who are engaged in photographic work, that ever dwell upon the subject, will probably believe that beauty and grace in position, or softness of shading, is wasted upon the awkward Hibernian whose early education has been much neglected, and unless his hands are posed directly to the front, with no crook nor subsidence in either shoulder, the work will probably be rejected as bad; and the soft shadows, scarcely perceptible, and prized so highly for their delicacy, will be greeted with the remark, "Be jabbers! and my face is not dirty!" On the other hand, customers of taste and judgment may require all the finest display of a man's artistic ability, and bring forth hidden genius as fully as sculpture or painting on canvas; but the photographer who considers all who enter his gallery with money in purse as "grist to his mill," whether Teutonic, Hibernian, or Italian, will find, in the endeavour to satisfy and gratify his customers, that the theory of photography as a fine art will give way to the endeavour to please his customers, and photography as a fine art suffers.

Notwithstanding this, photography is one of the fine arts. From the amateur or photographer who is able to say, "Sit as I place you, and be content," great conceptions of the beauty of the human form and face may be evolved; his own capability will be developed, and the inspirations of genius may be evoked, but it will be at the expense of a photographic business. The business man pleases his customers, the artist pleases himself.

One cannot but envy those whose lot it is to photograph nature in the open fields, among the whispering trees, near the laughing brooks, where beauty may be viewed in manifold aspects, and where they may choose their own with none to gainsay its truth, for God made it. There the artist may luxuriate, feeding his mind, and ever gaining grander and nobler thoughts from the contemplation of the Creator's magnificent handiwork.

But the commercial value of one's work, how shall that be regulated? By what process shall one receive a just compensation for the combined labour of body and mind that is undergone by the photographic art-student? Theory has it that a grand combination may be made of the craft, setting a value upon each and every style of picture made, and thus securing to all that equal proportion of profits which each thinks himself entitled to. But practical experience proves that there are always "black sheep," who wait until prices are regularly established, and then suddenly announce, "Card photographs, \$1.50 per dozen!" "Whole-sized photographs for \$1.00!" to say nothing of these extraordinary persons who offer four, twelve, sixteen, and even fifty gem pictures for twenty-five cents; and thereupon ensues a rush to their galleries, and their neighbours, sick with envy, commence to lower their prices, until it is a hurly-burly scramble who shall make pictures at the lowest figure, without regard to quality or cost. Yet for this who can name a remedy? Human nature will always be

* *The Philadelphia Photographer.*

the same, and considerations of general welfare will too frequently be sacrificed for the interest of the individual.

An individual photographer may remedy it, as regards his own place of business, by making a regular custom, and not being dependent upon transient trade; certain galleries may deal only in certain styles of pictures, making a speciality of ambrotype, paper, or painted work; but those operators of a middle class, who deal both with the upper and lower strata of society, must make occasional spasmodic efforts to attract public attention, or be left behind by their "black sheep" neighbours before mentioned. But here arises a question for the careful consideration of the craft. May it not be more justly and profitably done—justly for the fraternity and profitably for one's self—than by a wholesale reduction in the price of standard pictures? There are a multitude of old and interesting "dodges," forsaken and forgotten, that, revived, would attract custom without detracting from the character of one gallery. Auto-photographs, double pictures, rose vignettes, the ivory-type, anything dignified with some new name and prepared in some new shape, would, perhaps, prove an advertisement quite as attractive as a lowering in prices of standard work. Ideas may differ as to what constitutes standard work, but the one who imagines that the old or new peculiarity introduced upon his premises is the standard, and consequently condemns all who may infringe upon his prices, will surely be enlightened by time.

The photographic work that, so far, has withstood all assaults, and seems likely to withstand more, is case ambrotypes, card photographs, and frame pictures. To the few who desire gem pictures to be considered as a standard, and long for the old price, "\$1 per dozen," it may be answered that gem ambrotypes can never permanently compete with case ambrotypes, and while albums exist can never supersede card-photographs; consequently they must be classed with the "dodges" as auto-photographs.

What, then, remains for the photographer to make his trade steady is to keep improving in the quality of his work, and not be frightened, nor unduly excited, because of some neighbour falling in the price, and consequently in the quality of his work, and, finding it impossible to continue at that mark, as suddenly rising, and thus presenting the aspect of the weathercock, changing with the wind. Remember, the "race is not always to the swift," and that such men are constantly selling out; and let us not forget that trade is dull—duller than it will be, for the cessation of the war stopped a demand for portraits that was over-inflated, and it is now, consequently, over-depressed. Therefore, grumble not, nor be impatient, but engraft upon the heart the motto, "Time overcometh all things."

Proceedings of Societies.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 6th ult., under the presidency of M. BALARD.

M. AIME-GIRARD announced the death of M. Leon Focault, one of their most illustrious members, who had been very closely connected with the Society from its commencement, and had, indeed, been one of its founders. M. Girard likewise commented upon the loss sustained by the scientific world generally by the death of Sir David Brewster.

M. DAVANNE stated that the Executive Committee had appointed M. Balard President of the Society, and M. Regnault Honorary President.

M. DE CONSTANT-DELESSERT submitted a positive upon glass in which several objects had been accidentally reproduced in their original colours. It had been obtained by exposing a plate during a very fiery sunset, when the landscape was brilliantly illuminated in gorgeous colours; the picture was under-exposed, and developed with iron and fixed with hyposulphite, but not varnished. It had been kept for three or four months, no particular care being taken to screen it from the light, and when viewed in a flat or oblique position, the original colour of the sky and of the hill slope were found to have been faithfully reproduced. M. Constant says:—

"Some time since I remember having heard of the fact of an American who had obtained natural colours in the camera whilst taking a portrait during an eclipse of the sun, and, on the occurrence of a similar phenomenon at Lausanne about a year

ago, I availed myself of the opportunity of trying the experiment. But, alas! the result was nothing more than an ordinary grey portrait, obtained by an exposure of double the usual period. Nevertheless, being in the possession of the negative which I now submit to the Society, I thought that there certainly might be some truth in the statement of the American photographer, and that he had obtained colours similar to those exhibited in my picture. I leave the question of the phenomenon to those more learned in the matter than myself, although I may mention that some time ago, when occupied with the Daguerreotype process, I several times obtained colour in various parts of the clothing and drapery of my sitters."

M. DAVANNE then communicated a few remarks on dry processes by M. de Constant. That gentleman spoke highly of the gum dry process, and stated that collodionized plates coated with a solution of gum to which a small amount of sugar had been added were found to keep very well, and gave remarkably soft and delicate results; they were likewise very rapid in their action. Plates prepared by M. Baratti's coffee process possessed exceptionally good keeping qualities, and were capable of being preserved in a serviceable condition for two years. M. Constant had likewise experimented a great deal with Bartholomew's morphine process, and was of opinion that although it was not so rapid in its action as the foregoing, still, for photographing objects presenting much contrast of colour, the method possessed a marked advantage. A very long exposure might be given to a negative without any bad effect, and it was only by means of this process that M. Constant was able to obtain a successful reproduction of a picture painted in green and yellow colours.

MM. FORDOS and DAVANNE communicated another note with reference to the destructive action of metallic powders upon photographic positives (see p. 176).

M. DARLOT presented the Society with an apparatus of gutta-percha constructed for the purpose of preserving sensitized collodion plates in a damp condition. The apparatus is so arranged that the plates are quite sheltered from any movement resulting from the motion of the water during the carriage of the machine, and the adherence of the collodion to the glass plate is therefore not interfered with in any way. M. Darlot exhibited a large number of negatives taken by means of the apparatus by General Mongin, to whom is due the credit of having originated it. Some of the plates were not exposed until four, eight, or even ten days after their preparation, and were not developed for several hours, and, in some cases, days, after exposure, which exceeded but little that of wet plates.

M. JEANRENAUD communicated to the Society his mode of operating with Swan's carbon process, and supplemented his remarks by executing, in the presence of the members, several of the essential manipulations connected with the method.

The proceedings then terminated.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Society was held on Wednesday evening, April 1st, in Myddelton Hall, Mr. W. W. KING in the chair.

The minutes of a former meeting were read and confirmed, and Mr. J. Cruttenden, of Maidstone, was elected a member of the Society.

The proceedings consisted chiefly of general conversation, no paper having been provided for the evening. Mr. Wharton Simpson described a print he had received from Mr. Gaffield, of Boston, illustrating the amount of light transmitted by different samples of glass (see p. 158 in our last). After some conversation on this subject, in which Mr. Goslett, Mr. Boeket, Mr. Shave, Mr. Dunmore, and the Chairman took part, Mr. Dunmore exhibited a fine portrait taken with a concentrated light. After some conversation on the subject, the proceedings terminated.

Correspondence.

PHOTOGRAPHY AND ARCHÆOLOGY.

DEAR SIR,—On reading Mr. Henderson's paper on "Photography as an Aid to Archæology," I notice that he alludes to the "labours of Fergusson and Hope in Indian architecture." Mr. Henderson does not seem to be aware that the photographs

(illustrating the work of Messrs. Forgussou and Hope) were taken by Colonel Biggs, R.A.; and, I believe, he received a medal, at the Paris Exhibition, for the pictures in question.—I am, dear sir, yours truly,

A. W. HOSMER.

Plymouth, April 6th, 1868.

KEEPING PROPERTIES OF TANNIN PLATES.

SIR,—As photographers will now be making arrangements for the ensuing season, I send the following particulars, showing the keeping qualities of the plates prepared by the tannin dry process. On the 9th of June, 1866, the plates were prepared: on the 30th March, 1868 (nearly twenty-one months after the plate was prepared), I took the negative, from which a print is sent herewith. The exposure was six minutes and a half; the day clear and bright. The minute particulars on the walls and thatch, the shadow on the dial, and even the stones and glass in the gable of a house on the opposite side of the churchyard, come out as clearly as on a freshly made plate. The experiment has been made also with a stereographic plate, prepared at the same time, and with equal success. The collodion was Ponting's bromo-iodized, newly made; the glasses received no preliminary coating; the bath, that used for his wet collodion; the preservative, 15 grains of tannin and $\frac{1}{2}$ drachm of methylated spirit to 1 ounce of water; developer, a solution of pyrogallie acid and absolute alcohol, mixed with nitrate of silver, citric acid, and water, at the time of developing. The picture did not start out, but developed gradually; and this is the only difference between this and a freshly made negative. The plates have been kept in a common white wood box with grooves, placed in a drawer in a room in constant use, so that they were kept dry. The lens was one of Grubb's applanatic, two inches diameter.

I have thought it right to trouble you with the above particulars, as they may be important to travellers, showing, as they do, the value of tannin plates to persons on long journeys, or in wild districts, in cases when an instantaneous photograph is not required. I have now used this process for more than six years (the plates I prepare myself), and though it may be slower than others, it is more sure; out of twelve plates I count on eleven negatives with certainty, and generally have the whole dozen.—Yours truly,

G. W. O.

April 5th, 1868.

[The print enclosed by our correspondent is clean and bright, showing, perhaps, a trace of under-exposure in lack of detail in deep green foliage and in the dusky non-actinic trunk of a tree. It is a striking illustration of the keeping qualities of the plates.—Ed.]

CLEANING VARNISHED PLATES.

SIR,—I see in a recent NEWS a method for cleaning old varnished negatives. I have used the following for years with perfect success:—Sulphuric acid (say) three parts, and nitric acid one part; mix in a saucer a small quantity, and apply with a clean rag to the varnished side, then the other side and edges all the plates to be coated; put them in a pan or other earthenware vessel; pile them up one over the other, so as to let the back of one plate come in contact with the face of the other; let them remain a few hours, then cover them with water; let them soak a day or two or more, changing the water a few times to get rid of the acids; rinse thoroughly in a couple of waters, and the plates are perfectly clean. A bucket of water should be provided beforehand, to wash the hands occasionally when coming in contact with the acids.

Acids, after making pyroxyline, will answer the same purpose by immersing the old plates in a dish.—Very respectfully yours,

C. R. LOBB.

Wadebridge, March 30th, 1868.

Talk in the Studio.

SOLAR ENLARGEMENTS ON CANVAS.—A correspondent of the *Philadelphia Photographer* gives the following details by which he states that fine results can be obtained:—"First prepare the

canvas with a very thin solution of negative varnish, then coat it with albumen prepared as follows:—

Albumen	...	...	...	10 ounces
Iodide of potassium	...	...	...	200 grains
Liquid honey...	...	...	...	2 ounces.

Beat to a stiff froth, and let settle; coat the canvas with the above in the following manner:—Pour a small quantity on the canvas, and with a broad varnish-brush carefully cover the whole surface (avoiding bubbles as much as possible), then pour a larger quantity of the albumen on, and float the canvas freely, and let it drain back into the dish. When dry it is ready for use. It is silvered as follows:—Take a solution of plain silver 30 grains strong, acidified with acetic acid 10 drops to the ounce, and flow it over the canvas in the dark; shake lively until the canvas has a smooth, clean look, then print, while wet, deep enough to make the image quite plain. Then develop with a saturated solution of gallic acid; wash well, and fix with soda 2 ounces, water 10 ounces. When fixed, wash thoroughly; and when dry, varnish with a very thin coat of negative varnish, and it is ready for the artist. Although with the above process I have made and sold a great many pictures of that kind, I prefer (and so does every good oil painter) to make a sketch through a carefully made transparent positive. In putting a photograph on canvas by any process, it alters the condition or consistency of the canvas surface so much that it is very difficult to preserve the purity and harmony of colours."

ANOTHER METHOD OF ENLARGING ON CANVAS.—W. M. Gardner also gives the following as an excellent method:—"First prepare the canvas. Rub it with pulverized pumice-stone, then make a paste of China clay and water, and coat it. When dry wash off, and, while wet, pour on a solution of 50 grains of bromide of potassium, 10 grains of water, 5 grains of cyanide of potassium, and set it aside to dry. When dry silver it with a solution of 30 grains of nitrate of silver, 1 ounce of water, $\frac{1}{2}$ ounce of acetic acid No. 8, and print while wet. Fix in a weak solution of hyposulphite of soda, and it is ready for the artist. This process is for solar camera printing; or, if wanted to print by contact, prepare the canvas the same way. Salt the same as plain paper, and silver it with a 40-grain silver solution, and tone and fix as usual. This process I have used for years, and have not had any fault to find with it."

COLLODION GIVING INTENSITY.—A correspondent writes:—"In August last you gave, in PHOTOGRAPHIC NEWS, formula for iodizing plain collodion, which formula is, I see, repeated in the new YEAR-BOOK, page 78. I have just tried $7\frac{1}{2}$ ounces of plain collodion which I so iodized about six months ago, and am much pleased with the result; the chief feature being greater resistance to the light in printing, enabling me in some cases to do without any redevelopment. I coated a plate half with the above, and half with an ordinary sample, and the difference in favour of that treated as you recommend is very great."

UTILIZING OLD NEGATIVE BATHS.—The same correspondent says:—"In respect of old baths, I have always used them up by neutralizing with com. soda at a rather high temperature, and boiling down to 60 grains sol. Used for printing, such a bath, with addition of sugar *a la Bovey*, gives very rich tones, of a maroon tint."

INTERNATIONAL COPYRIGHT WITH AMERICA.—We mentioned a few weeks ago that a Bill for International Copyright with this country had been introduced into the House of Representatives, U. S., and expressed a hope that works of fine art would be included. The American correspondent of a daily contemporary says:—"Frightened by the petitions from the friends and opponents of an International Copyright Law, the joint committee on the library has 'come to an informal understanding' to postpone indefinitely action on the Bills already referred from the Senate and House. A long farewell to international copyright!"

OLD BATHS.—A correspondent, Mr. C. R. Lobb, of Wadebridge, sends us the following:—"A simple way of evaporating old negative baths to dryness is to put the evaporating-dish in the kitchen stove on a little sand, open the door every ten or twenty minutes to let out the steam until evaporated to perfect dryness, and let it slowly cool; leave it a few hours, and the silver will part from the basin, and can be removed quite easy. I find the above plan more rapid and much less trouble than the sand-bath. I quite agree with all that has been said: the silver is quite equal, if not superior, to new, for making a bath. The last few days I have been trying the silver for printing

evaporated from old negative baths, and I find it quite equal to new. Sugar added to the printing-bath is a great success; but how long the paper will keep in summer remains to be proved. Probably, in very hot weather, more sugar may be required. I enclose a street view taken with a bath doctored with cyanide evaporated to dryness, and made 35 grains to the ounce, but I do not think a bath treated with cyanide lasts long."

COL. BURKE'S PHOTOGRAPH.—An order was made a few days ago upon a photographer to deliver up all portraits and negatives in his possession of a portrait of Col. Burke, which had been published, and the registration at Stationers' Hall was ordered to be cancelled.

RAPHAEL REPRODUCTIONS.—The collection of photographs, engravings, &c., of Raphael's works, commenced by the late Prince Consort, has been continued by the Queen. It will ultimately be bound in about 50 or 60 huge volumes, and at the present time a catalogue of the whole collection, which has been compiled by Mr. Roland, formerly librarian to his Royal Highness, and who has had the largest share in the labour of forming it, is being rapidly carried through the press. It is understood that though this work is, in the first instance, intended by Her Majesty for distribution in the way of presents among her personal friends, foreign Sovereigns, and others who have aided in carrying out the Prince's plan, a special edition will afterwards be published for the use of amateurs and Raphael collectors.

PHOTOGRAPHIC CONVENTION IN AMERICA.—A national convention of photographers will be held in the United States in course of the present month, to consider many subjects at present affecting the general interests of the profession. The bromide patent, the tax upon photography, the prices of photographs, and various other topics, will be brought under attention, and motions passed with regard to them.

To Correspondents.

PHOTOGRAPHER (Derby).—Streaks on the plate may be due to various causes: floating seum on the surface of the solution, immersion before the collodion is sufficiently set, alkalinity, insufficient iodizing, or excessive strength of the solution will tend to this result. To avoid it, see that there is no floating seum on your bath, that the solution has a slightly acid reaction, and avoid immersing the plate until the film is sufficiently set; also, when there is a tendency to streaks, keep the plate in motion all the time it is in the bath, from the moment of immersion until it is ready for use. 2. Marblings may also arise from various causes, as they are of various kinds. If you will describe specifically those which trouble you, we will endeavour to help you to a remedy. 3. For photographing interiors, double or triple combinations are necessary, as single lenses will give curved lines. A portrait lens may be made to answer very well.

W. J. A. G.—Much depends on circumstances. If a very slight increase of intensity is required in the finished negative the use of tincture of iodine, to turn the deposit to an olive tint, is very efficient; but care is necessary in using this, because if its operation is continued too long the colour becomes of a light yellow tint, not at all non-actinic, and the molecular character of the deposit is changed, so that light is easily transmitted, and the negative is made less vigorous than before. The method recommended by Mr. England, in which the varnish is removed by alcohol, and the negative intensified with an alcoholic solution of pyro and silver, gives a little more control over the operations. You will find it described in detail in our YEAR-BOOK for 1867, p. 64. 2. For intensifying before fixing the use of an iron solution with a trace of silver involves the least trouble. For intensifying after fixing pyrogallie acid and silver is, we think, more efficient than an iron solution. 3. Two thicknesses of the black twill you enclose may be safely used, we think, for covering a dark tent.

C. BURTON.—Much depends on your skill and experience, as to whether it will be wise for you to attempt to albuminize the paper yourself. It is not a difficult operation; but still, unless you have had some experience, we cannot advise you to rely on your own operations, but should rather recommend you to send the stock of plain paper you have to some one engaged in the business to albuminize for you. If you wish to try, beat up the whites of fresh eggs thoroughly, and add 6 grains of chloride of ammonium to each ounce of albumen solution. Float for half a minute, and hang up the sheets in a room at a temperature of from 70° to 80° Fahr.

J. B., N.—If you find the collodion too thin, and the negatives are lacking in vigour, you may, without any impropriety or risk, add

more pyroxyline; we should think at the rate of about 1 grain to each ounce of collodion. But your safest plan will be to experiment on a small quantity (say a couple of ounces) before touching the bulk. If, on trial, this is satisfactory, you can then deal with the whole.

R. GILL (India).—We fear that, from some cause, a combination which takes place between the silver and the size in the paper becomes decomposed before the prints are fixed, and an insoluble silver compound remains in the paper, causing the dirty brown, mottled, opaque markings seen on looking through the print. It is difficult, without a more precise history of the case, to indicate accurately the cause of the evil, but we may make some suggestions which, if observed, will probably remove it. See that your albuminized paper is not kept in a damp place, and that it is not used when any indication of decomposition in the albumen is present. Do not use the silver bath too strong, nor float too long: a 40-grain bath, with three ounces of alcohol in each pint of solution. Keep the sensitized paper dry, and print, tone, and fix as soon after the paper is prepared as possible. Use a very strong fresh hypo bath. Try omitting the fuming; we scarcely recommend fuming in a hot climate unless the silver bath contain free nitric acid. If fuming be applied, the paper should be printed, toned, and fixed immediately after. The opaque mottling might be due to imperfect fixation only, but, from the discoloured appearance you describe as being present before fixing, it is evident that some decomposition takes place in the sensitized paper.

COLLODION.—The proportion of water present in a toning bath regulates the rapidity of the operation, but beyond that it is not important. Various formulae vary in giving from 2 ounces to 10 ounces of water to a grain of chloride of gold. In very hot weather, when the bath is active, we should probably use 8 or 10 ounces of water; in winter not more than 5 ounces. 2. The process of complete development ought not to require anything like an hour; a quarter of an hour would be a full time. 3. Be so good as to state details of your experiment with the morphine process, so that we may, possibly, point out the cause of failure. 4. The use of a trace of a bromide in alkaline development is to prevent fog, which it does very effectually; too much would retard development.

R. M. D.—The mottling and faintness of the print are due to the use of a weak silver bath, or to imperfect contact of the albuminized paper with the solution. Sometimes, when too small a quantity of the silver solution is employed, so as to cover the bottom of the dish imperfectly, such a result will follow.

J. L.—The explanation is what we anticipated; but it merely shows how erroneous was the original statement. An intermittent exposure during different parts of an hour is not an hour's exposure, inasmuch as the plate is not exposed during each interval in which the lens is covered. 2. The process of covering the lens during movement of foliage, and uncovering so as to secure the brief intervals of stillness, is not altogether unusual; but it requires great care, and shows most praiseworthy patience. 3. Thanks; but the compilation would not possess sufficient interest for publication.

READER OF THE NEWS.—The query in your former letter mentioned sulphate of soda. The accidental addition of phosphate of soda to hyposulphate of soda would, probably, be without any action in fixing, especially if care were taken to keep the fixing bath of full strength. Its precise result is, however, matter which can only be decided by experiment. Phosphate of silver, if formed, is not soluble in hyposulphite of soda. Try the effect in a small experiment before risking many prints. 2. The dog is capital.

YOUNG PHOTO.—The forms for registration are one penny each. Our Publisher will obtain some for you if you send him stamps and a stamped and addressed envelope. He will also superintend the registration if you send him the form properly filled up, and the office fee 1s., and 6d., in stamps.

Several correspondents in our next. Owing to the necessity of going to press a day earlier this week, a larger number of correspondents than usual are necessarily left over.

Photographs Registered.

- Mr. J. COLLINGS, Cardiff,
Two Photographs of Marquis of Bute.
- Mr. R. CARLYLE, Grassmere,
Photograph of Port Wordsworth.
- Mr. R. CADE, Ipswich,
Photograph of J. P. Cobbold, Esq.
Photograph of R. C. Ransom, Esq.
- Mr. A. CLARKE, High Street, Stourbridge,
Photograph of Rev. C. H. Craufurd.
- Messrs. APPLETON, Bradford,
Lithograph of Rev. C. Garrett.
Lithograph of Rev. P. McKenzie.
Lithograph of Rev. J. Rattenbury.
- Mr. E. HARRISON, Newcastle, Staff.,
Photograph of Bishop Selwyn.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
New Method of Intensifying: Yellow Negatives	181	Jottings about Photographic Copyrights.....	187
Mr. McLachlan's Discovery.....	181	Proceedings of Societies—South London Photographic Association—London Photographic Society.....	188
Mr. Woodbury's Photo-Relief Process	182	Correspondence—Photography and Disease—Some Dry Plate Hints	191
A Man's Property in his own Portrait.....	182	Talk in the Studio	191
Copyright and Piracy	183	To Correspondents.....	192
Visits to Noteworthy Studios	184		
Pictorial Effect in Photography. By H. P. Robinson.....	185		

NEW METHOD OF INTENSIFYING—YELLOW NEGATIVES.

WE have to bring before our readers a new method of intensifying negatives, which has the merits of extreme simplicity and efficiency, and of preserving delicacy whilst adding materially to the printing value of the image. Photographers are familiar with the value of the intensity which is gained by the non-actinic colour of the deposit rather than its thickness. Wherever vigour in the negative has to be secured by piling up the silver forming the image there is a risk of losing delicacy, sometimes by the granular nature of the additional deposit, and sometimes by its tendency to lateral spreading; but where the resistance to light in the dense parts of the image can be increased by a change of colour rather than a material increase of thickness, the delicacy and sharpness of the image as first developed are retained without sensible diminution.

The method we have recently discovered consists in treating the fixed and washed negative with a solution of permanganate of potash, by which its colour is changed from the dusky grey, common to an iron developed negative, to a tint of a brownish yellow or olive by reflected light, and orange by transmitted light. No appreciable thickness or opacity is communicated, but a great increase in the actinic character of the deposit is produced, so that, with a comparatively thin and delicate negative, great vigour is obtained in the prints.

The image is so transparent and delicate, almost resembling, in some instances, orange glass, that our first impression was that no additional deposit was produced on the image, but that the metallic silver of which it was formed was converted into oxide of silver, which, in a fine state of subdivision, gave the non-actinic yellow tint produced by silicate of silver in yellow glass; but, on further examination, we were satisfied that this was not the only change effected. The permanganate of potash, on coming into contact with the silver image, is decomposed and parts with oxygen, which combines with the silver; at the same time binoxide of manganese is precipitated upon the image. It is probable that, following some chemical analogies, a double oxide of silver and manganese is formed, to which the colour of the image, slightly different to that of either oxide alone, is due; but whether this is the case, or the deposit consists of a layer of oxide of silver and a layer of binoxide of manganese superposed upon it, remains to be determined by further examination. The colour of oxide of silver is an olive brown; that of binoxide of manganese, when artificially prepared, a yellowish brown. The colour of the intensified image is slightly different to either, but partaking of both, and varies, of course, according to the extent to which the action is carried.

The best mode of proceeding is to place the fixed and

washed negative in a dish containing a dilute solution of the permanganate, say ten grains or less to an ounce of water. Probably a dipping-bath would answer better still. The rapidity of the operation will depend on the strength of the solution, and may vary from three or four minutes to a quarter of an hour. Pouring the permanganate on to the plate, especially if the solution be strong, is apt to cause stains of unequal action, as the slightest pause in the flow of the solution is apt to produce a line. The first change observed is the change from the red tint of the permanganate solution to the green tint of the manganate, the negative at the same time acquiring a light yellowish brown tint on the surface only. As the change progresses, this tint deepens and passes right through the film, becoming as apparent at the back of the glass as at the front. The change can, of course, be stopped at any point when a sufficiently actinic effect is secured. The intensity increases, in some cases, considerably on drying, but is restored to the condition of the wet negative by varnishing.

Whether this mode of intensifying will supersede other modes in use can only be determined by experience. At present, we offer it simply as an additional power to the photographer, the exact value of which will be decided in practice. The permanency of such negatives is necessarily a question of time; but, reasoning from analogy, we have no reason to doubt it, as binoxide of manganese is one of the most stable bodies with which we are familiar.

MR. MCLACHLAN'S DISCOVERY.

MR. MCLACHLAN's communication to the London Photographic Society, made on Tuesday night, is a most important one. Partial as the disclosure must necessarily be when made under the disadvantages of a brief verbal statement at the close of a meeting, it contains matter sufficiently startling for attentive consideration.

Opposed to all accepted theory and hitherto ascertained fact, Mr. McLachlan proposes, in working the wet collodion process, to secure alkaline conditions in bath and collodion as the means of securing immunity from streaks, stains, and fog. He proposes to get rid of the most prolific source of pinholes, the accumulation of iodide of silver in a bath, by destroying its capacity to hold iodide of silver in solution. These are two of the leading results which, amongst many others, Mr. McLachlan proposes to secure, and he asks, assuming the facts to be true, and holding him responsible for their truth, are these conditions which it is important to the photographer to be able to secure? We answer that they undoubtedly are. The presence of nitric or other acid in a bath, at present regarded as almost imperative to clean working, must undoubtedly exercise a disturbing influence on the primary reactions intended to take place, in order to form iodide of silver; and a method

of working with certainty of cleanliness in an absolutely neutral or slightly alkaline bath is in itself a power which promises a long train of advantages of which photographers will gladly avail themselves. The immunity from the most fertile source of pinholes, the gradual accumulation of iodide of silver in the bath, is an advantage that does not require affirming.

We just briefly glance, in passing, at two of the features of a system of working in regard to which its author promises, on occasion of fuller explanation, to point out variously ramifying advantages. Our immediate aim is to give as clear a *resumé* as we can, briefly, of the operations already stated.

Mr. McLachlan commences with a denial of a generally accepted proposition, namely, that a pure neutral solution of nitrate of silver is not altered by light. Although not apparently changed by light, he states that after exposure it has acquired new properties. He dissolves nitrate of silver, by preference of a given quality described on another page, at the rate of one ounce in an ounce of distilled water, and exposes it to the action of light; the longer the time and the more sunny the weather the more perfect the result; but at least a month of summer weather is desirable. The proof of new properties acquired is thus made:—To an ounce of the solution, unsunned, add one drop of a solution of caustic potash containing one grain to the ounce; the result will be the production of turbidity from the precipitation of oxide of silver. Now add a drop of the potash-water to the sunned silver solution, and whilst oxide of silver is formed it is at once redissolved. A considerable amount of the potash solution may be added, Mr. McLachlan states, to a thoroughly sunned bath, and the oxide of silver will be redissolved as rapidly as it formed. This capacity for holding oxide of silver in solution, and preventing its precipitation, is the source of cleanliness and freedom from fog in using an alkaline bath.

After sunning the strong silver solution, to 1 ounce of which 1 grain of the potash solution has been added, 2 grains of iodide of potassium dissolved in a few drops of water are added to 10 or 12 drops of the strong silver solution, and the iodide of silver formed is, after washing, added to 1 ounce of the strong silver solution, by which it is, of course, at once dissolved. Pure distilled water to dilute the solution to a strength of 35 grains to the ounce is now added, and this causes no precipitation of iodide of silver, and the bath may be used at once; but in the course of four or five days another singular property acquired by the silver solution is manifested: a sudden precipitation of iodide of silver takes place, and the solution, according to Mr. McLachlan, has lost the power of dissolving or precipitating any more of this salt. No addition of water produces turbidity or causes further precipitate of iodide; and, in the course of use, no further accumulation apparently takes place, or, at least, no manifestation of its presence in the shape of pinholes.

Then a suitable collodion is required, for Mr. McLachlan lays great stress on the importance of harmonious relation of the various chemicals. At a future time he will explain the manufacture of suitable collodion; but for the present explains the doctoring of a commercial sample. Take a good commercial sample of a certain type—Mawson's is selected as the illustration—in a red acid condition, such as ordinarily secures brilliant and clean negatives. A plate coated with this, and immersed in this alkaline bath, will give inevitable streaks, brain-markings, and other troubles. To get rid of these the collodion must be made neutral by adding a few drops of the potash solution, and, after this treatment, the neutral collodion in the alkaline bath will give a clean brilliant negative—delicate, harmonious, and well modelled, with a shorter exposure than is obtained by the usual mode of working.

For a special mode of preparing the developer, we refer the reader to the report of Mr. McLachlan's remarks on another page, and for fuller elucidation of his system of working they must await his further communication.

It is probable that Mr. McLachlan might have done himself and his method more justice by a written communication, as nothing enforces precision and the absence of redundancy more certainly than the necessity of writing. As the matter stands, he has afforded sufficient information to excite expectation and stimulate experiment, after which a fuller written paper will be received with greater interest and fuller appreciation.

MR. WOODBURY'S PHOTO-RELIEF PROCESS.

WHEN an important discovery is made it is scarcely surprising that many claimants for the honour and possible profits of its paternity should start up, as the vanity, cupidity, and capacity for self-deception which exist in the world are prolific parents of such claims. But it is not a little surprising to find, in addition to these, other claimants perversely created by the carelessness or misapprehensions of the recognized recorders of progress in the periodical press. We are not aware, for instance, that M. Braun has ever claimed for himself the discovery of Mr. Swan's carbon process; but we have had very repeatedly to point out for correction erroneous claims made for him by journals which ought to have been better informed.

A similar error is made in the April number of our excellent monthly contemporary, the *Art Journal*, in which an article is devoted to the description of a method of printing, headed "M. Disderi's Patent." The process is really that well known to photographers as Mr. Woodbury's photo-relief process, an example of which was placed before our readers a couple of years ago, the English patent of which was recently sold by Mr. Woodbury to a company, of which M. Disderi is managing director. The process is mentioned, however, throughout as "M. Disderi's method," and only by a passing allusion at the end of the article is any recognition made of the actual originator of this mode of printing. "The peculiarity on which the patent is based is the invention of Mr. Walter Woodbury," it is stated, and the conclusion to which the whole article points, and which, if it be not contradicted, it may be hereafter quoted to prove, is that M. Disderi has patented a new process based upon the relief process of Mr. Woodbury. The simple fact is, that the process which has been put into operation with so much energy and success by M. Disderi is that which has been worked out in its minutest details to its present state of perfection solely by Mr. Woodbury, and the origin of which has never been claimed by M. Disderi.

We have pleasure in noting here that the commercial working out of the process under M. Disderi's superintendence at the establishment at Brompton appears to progress very successfully. The minor difficulties attendant upon working out, on a large scale, a mode of printing based upon new principles and involving many new conditions have gradually disappeared, and excellent pictures on glass and paper are now regularly produced, whilst the sales and orders are already in excess of the supply.

Mr. Woodbury, who has recently been on a business tour on the Continent, has made arrangements which will speedily introduce his process into Italy, and also established negotiations which will probably be speedily followed by its introduction into Austria and Bavaria. The enterprising firm of Goupil and Co., so well known in connection with the extensive publication of engravings and of photographic art reproductions, are rapidly making arrangements for working the French patent on a large scale; and Mr. Woodbury shortly leaves for the United States to take the proper steps for initiating commercial operations with the process under the auspices of a powerful company in America.

A MAN'S PROPERTY IN HIS OWN PORTRAIT.

A few years ago an American paper contained an advertisement from a murderer under sentence of death, warning the public that a certain photograph of him, recently published,

was not issued by his authority or consent, and advising intending purchasers to wait a few days for the issue of a new portrait, which, he remarks, will be "taken with my clothes on at the time when the deed was done." A case recently brought before a Judge in chambers reminds us of this case. It appears that a photograph had been taken of the Fenian Colonel Burke in Clerkenwell prison, for the purpose of identification, as the custom now commonly obtains in prisons. When first asked to sit he objected, apparently on the ground that its publication might lessen the value of a portrait which he had already assigned to Mr. O'Halloran as part consideration for his bearing certain legal expenses for him. On being assured that the prison portrait would not be published, he consented to sit, and a negative was obtained. By some indirect practice it appears the negative was reproduced by a Mr. Turner, and the portrait announced for sale in a sensation placard as being the only authentic portrait, and having been taken by command. Application was made by Mr. Merriman, on behalf of Col. Burke, to forbid the publication of these portraits, and the facts having been sworn to, a rule nisi was granted.

On subsequently coming before the Judge a decision was obtained in favour of the application. As the case possesses some interest, we give such detail of the proceedings as we find in the daily papers reporting the case. At the second hearing,

Mr. Merriman (for Col. Burke) said that as there could, he presumed, be no answer to the case stated in his affidavits, he should content himself by referring to them, and to the statutes 24th and 25th Victoria, cap. 73, sections 1 and 7, and 5th and 6th Victoria, cap. 45, section 14, and to await the answer of his friend Mr. Shaw.

Mr. Shaw (for Mr. Turner) said that he must admit his client was entirely in the wrong, but that he had been misled by Captain Codd, the governor of the Clerkenwell prison. Mr. Turner was willing to deliver up the negative and all the copies in his possession, and to pay over to Mr. Merriman's client every farthing he had received from the sale of the photographs; but that he hoped his lordship would limit the amount of costs, and would stay all further proceedings against his client.

Mr. Justice Willes (addressing Mr. Merriman).—What do you say? It appears that Mr. Turner is willing to do everything that is right on his part.

Mr. Merriman said he had no objection to an order on the terms asked for by Mr. Shaw, if his lordship thought he could make such an order. The offence under the statute was a misdemeanor, and as to the question of costs he left himself in the hands of the learned Judge.

After some further remarks on either side,

Mr. Justice Willes made an order expunging the photographer's entry at Stationers' Hall; that all further proceedings of every kind should be stayed upon the delivery up of the negative and the printed copies, and payment of the amount received for the sale of the pictures, to the satisfaction of the applicant, and two guineas costs.

There appears to be some mistake in the report as to the statutes referred to by Mr. Merriman. The statute 24th and 25th Victoria, cap. 73, is a brief Act referring to copyright in designs, and does not contain seven sections. The reference here intended is doubtless to the Fine Art Copyright Act, 25th and 26th Victoria, cap. 68. In this, the first section defines the conditions under which a copyright can be obtained in a photograph; and the seventh section forbids the fraudulent description of, or assumption of, copyright in any work of fine art. The other statute referred to, 5th and 6th Victoria, cap. 45, section 14, enacts that any person feeling himself aggrieved by any false entry in the book of registry at Stationers' Hall shall be at liberty to apply to a court of law to have such entry expunged, which, it will be noted, was done in this instance.

The publication of a portrait without permission is not a thing likely to be of common occurrence, because, both as a matter of good feeling and policy, few photographers would so far disregard the wishes of a sitter; but the question of the legal right to publish a portrait without the consent, or in defiance of the wish, of the original, has not before, that we remember, been the subject of a decision in an English court. The question was recently raised in France by Alexander

Dumas, when his portrait and that of Miss Menken were issued in one group; but in that case the decision was adverse to the applicant and in favour of the photographer.

COPYRIGHT AND PIRACY.

We reproduce, in another page, an interesting *resumé* of the facts as they stand in relation to the law of fine art copyright, especially in its relation to photographic piracy. Our contemporary, the *Stationer*, in this article, deals leniently and tenderly with the photographic copyist and the vender of photographic copies, believing that ignorance rather than dishonesty accounts for the circulation of piracies in a large number of cases; and further believing that print publishers are themselves guilty, not simply of great folly, but also of moral wrong, in not satisfying the craving of the public for cheap copies of works of fine art, and in omitting to issue details of those goods in which they claim copyright.

We have already often expressed our conviction of the impolicy of print publishers in not issuing small photographic copies of their own works, and so driving piracy out of the field by rendering it unremunerative. The risk of piracy can only be compensated by large sale or large profits, both of which would be reduced by the competition of authorized photographic copies of copyright works. The fact that the issue of photographic copies pays the pirate sufficiently to cover the risk he runs is a guarantee that it would pay the print publisher, who would run no risk. The plea that the sale of the engravings themselves would be injured by the issue of small photographs would not be sustained, we feel assured, in practice. It is rather probable that issue of small copies of a good picture would serve as an advertisement, and extend rather than diminish the sale of the engraving. The charge of moral wrong in not supplying a public want will be, however, indignantly repudiated, it is probable, by the print publishers. So long as they believe that they would sustain personal loss they will naturally ask why they, as traders, should make sacrifices for the public good.

But the suggestion of our contemporary that owners of copyrights ought to make it clear to any one concerned in what pictures they claim copyright is a most important and reasonable one. It ought to be possible to ascertain what is copyright and what is not. At the present moment no such possibility exists. Even the arduous task of searching the registry at Stationers' Hall would fail to afford any satisfactory information, inasmuch as no copy of the design or picture is preserved there. After spending many hours in the search for a special entry it will be found to contain only a vague description of the subject in which copyright is claimed. Take an example from a class with which we are familiar. It is desired to ascertain if a certain portrait of Mr. Disraeli, photographed by Mr. Smith, is copyright; and at length an entry is found running thus,— "Portrait of Right Hon. B. Disraeli, full face, standing position, arms folded;" the due particulars of Mr. Smith's ownership being appended. But it may happen that half-a-dozen portraits of Mr. Disraeli may have been issued by Mr. Smith, every one of which answer to the general description in question; and who shall say to which of them it was intended to apply at the time of entry, or which of them is protected by the registration?

To this it may be replied, that the difficulty in finding an owner for anything affords no excuse for stealing it; that there is a property morally, if not legally, in all designs, and that the facility for copying and appropriating the ideas of another without legal risk should not be made too easy. There is a certain amount of force in this argument, but it is only of very limited application. There exist many engravings of which the copyrights have lapsed by time or neglect, and many copyrights of which no steps were taken to secure. The reproduction and publication of these as

photographic scraps would afford legitimate employment to many photographers, and their distribution would afford pleasure and profit to many thousands of the public. But the conscientious photographer feels himself placed in constant difficulty and danger for lack of certain information as to what he may or may not reproduce with impunity, and without infringing the rights of others. The suggestion of our contemporary to establish a museum of art in which shall be preserved photographs of all works in which copyright exists, readily accessible to the public or those concerned, is, we think, a most useful one, and well worthy the attention of all interested in the maintenance of copyrights on the one hand, and in photographic reproduction on the other. We hope that this part of the question will not be overlooked in the introduction to Parliament of a new Copyright Bill, which is, we understand, contemplated at the first convenient opportunity.

VISITS TO NOTEWORTHY STUDIOS.

MR. ENGLAND'S ESTABLISHMENT AT NOTTING HILL.

WE shall not ask our readers to follow Mr. England to any of the grand studios wherein his magnificent negatives have been produced and his triumphs won: it is not to Niagara, or the streets of Paris, or up the Rhine, or to the peaks and passes of the Alps, which have for years past served as his theatre of operations, with mountain and waterfall, pine forest or rocky glen, for his models, that we now direct the attention of our readers. Our present purpose is to give a brief sketch of one of the most complete establishments we know for printing, and, indeed, all operations connected with photography except portraiture.

The primary purpose of the Notting Hill establishment is printing, and to that end the arrangements are chiefly directed. The most noticeable feature is the large and conveniently arranged printing space under glass. This consists of something like a large glass house, with an area of about 1,300 superficial feet. All round this space are arranged racks or tables, capable of holding from 700 to 1,000 printing-frames, the racks being provided with an arrangement whereby they may be placed at an inclination so as to place each frame at right angles with the sun when it is desirable to print in direct sunlight. The roof consists of a series of sliding skylights, which afford a covering in wet weather, but which are easily moved, so as to bring the printing-frames under the light of the open sky when required. The stands or racks upon which the printing-frames are arranged move on castors, and are readily wheeled into the open air or under cover, into sunlight or shade, as may be required.

A capital arrangement for producing a graduated tint for skies is employed, in order to get rid of the unpleasant mass of white paper which surmounts the landscape printed from a negative taken on a bright cloudless day. It consists of a series of horizontal grooves, the upper half of which is a piece of zinc or tinned iron, curved upwards so as to form a gradually widening aperture, something like this—

The print is placed in the groove so as to protect the portion of the image already printed, the sky portion being exposed to the light in degree regulated by the curved cover, and receives a graduated tint which diminishes greatly as it approaches the horizon of the landscape. As white skies are to Mr. England an abomination, and as it would be almost impossible to print a graduated tint on the large scale necessary, if every impression required carefully shading by hand, in the manner generally adopted, this arrangement for securing a graduated tint is found very valuable.

On examining the frames exposed, we notice that a large number of the negatives have been manipulated in various ways to increase the pictorial effect of the prints, and we learn that Mr. England does not consider it any enormity

to improve his negatives by any of the various methods which experience or ingenuity may suggest as giving value to the final result. Where a portion of the landscape prints through too rapidly, and so buries detail in the print, it is covered with a piece of tracing-paper, the edge of which is serrated so as not to make a hard line, and by printing in diffused light the production of an apparent line or edge is avoided. Sometimes the whole landscape is covered in this way, leaving the sky uncovered, that it may print through a little more perfectly than it could do if the other portion were not thus masked. Sometimes the sky is covered and the foreground uncovered; sometimes merely a piece of very deep foliage is thus protected; but in all cases, with judgment and care, and properly used, this delicate masking is found of great value in securing harmony in the picture.

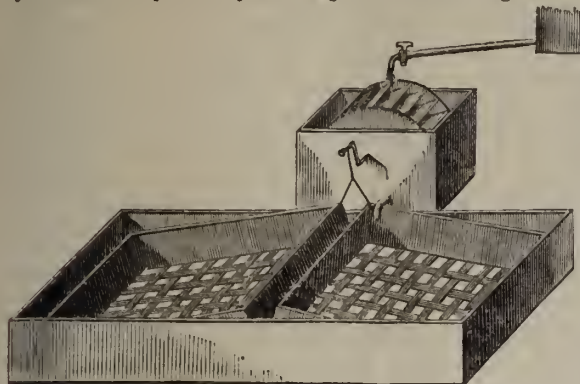
A large number of the negatives we saw in the course of printing had very effective clouds introduced into the skies, by a method which may prove useful to many of our readers. Mr. England has found the black-lead pencil retouching upon negatives, described some time ago in our pages, very useful for many purposes; but for strengthening clouds already indicated, or introducing them when none are visible, black-lead in the shape of powder is found most useful. This is applied with a stump, after the manner of crayon drawing, by which soft graduated edges to the clouds can be produced. The stumps used by Mr. England, and which seem most efficient, are made by tying pieces of sheet india-rubber over the end of a stick, stuffing with a little of something soft if necessary. The bite of the india-rubber makes the process of graduating the black-lead comparatively easy and simple. The negatives which have received this treatment are chiefly those by the modified collodio-albumen process, the hard surface of the film affording ready facility for the application of the black-lead, which is protected from further rubbing by the varnish which is applied afterwards.

A characteristic feature of Mr. England's establishment is found in the fact that every possible operation connected with the production of photographs is conducted on the premises. Collodion, albuminized paper, nitrate of silver, chloride of gold, &c., are all prepared in the establishment. A carpenter's shop, fully equipped, furnishes facilities for making or modifying much of the apparatus. A very excellent furnace is employed to reduce all the residues and furnish the pure metals for preparing the salts of silver and gold required.

We have before described Mr. England's albuminized paper; suffice it to say now that the formulæ we stated some years ago is in use now. To each ounce of pure white of egg 5 grains of chloride of barium and 5 grains of chloride of ammonium are added, and the paper so prepared is found to give uniformly rich and brilliant prints. It should be noted that as the chloride of barium employed only contains half as much chlorine as the ammonium salt, the 10 grains of chloride employed are about equivalent to 7½ grains of chloride of ammonium. The paper so prepared is excited on a 40-grain silver bath, in which, to every pint of water, 3 ounces of methylated spirit is added, which arrests discolouration of the bath and of the prepared paper.

The paper is sensitized in whole sheets, about fifty of which are printed every day in cabinet or stereo pictures. The system of toning adopted has been employed without variation for many years, and is found to give excellent and certain results, either of a warm tint or a deep neutral black. Half an ounce of a saturated solution of bicarbonate of soda is added to 15 grains of chloride of gold and about three pints of water, the solution being used about an hour after it is mixed. As bicarbonate of soda is sparingly soluble, a saturated solution containing about 10 grains to the ounce, it will be seen that the toning bath is scarcely alkaline, containing not more than one-third of a grain of carbonate of soda to each grain of chloride of gold; a proportion just sufficient to decompose the chloride and set up toning action without producing an alkaline condition.

The washing arrangements are very excellent. After the fixed prints have received three or four rapid changes of water to remove the bulk of the hypo, they are transferred to the washing machine, an invention of Mr. England, and used by him for the past ten years, diagram of which we give. It



consists primarily of a large trough 7 feet long, by 4 feet 6 inches wide, and 11 inches deep. Placed in this are two trays with lattice work, made of gutta-percha strips, at the bottom. Just above, supported by a bracket on the wall, is a box containing a water-wheel turned by the stream from a tap just above it. The two trays are connected with this wheel by a rod attached to a crank, and as the wheel revolves the trays are kept in a constantly oscillating motion, which serves the double purpose of preventing the prints from sticking together, and of securing more effectual washing than is effected by great soaking. The water which turns the wheel passes through a pipe at the bottom of the wheel-box into the washing trays; and about once in every hour, the large trough having become full, brings into action a syphon, which empties it in ten minutes, leaving the prints to drain for a time, resting on the gutta-percha lattice work. The washing, thus managed, is found to be very effectual. The prints are removed each morning after a night's washing, and placed in a straight heap in a screw press, by which all the water is squeezed out of them, which is a more effectual aid to drying than blotting off; and when spread on canvas frames the prints rapidly dry flat and even, with little curling or cockling.

It is not necessary here to describe the complete and efficient means of saving and reducing the residues and waste, nor to enter into the details of mounting, printing the mounts, &c., beyond mentioning, in passing, that for the mounting a thick fresh solution of gum arabic is preferred to paste, glue, or india-rubber.

We find in the course of conversation that the modification of the collodio-albumen process, by which all the plates for last summer's campaign were prepared, was so far successful that Mr. England will employ it again this summer with even more hope than before. The negatives produced by it, we find, on examination, are singularly like those produced by the wet process, possessing even a trace more softness, delicacy, and detail than Mr. England's usual wet collodion work. They are also, singularly unlike most dry-plate negatives, free from abnormal deposit or fog of any kind, here and there a little bare glass in the deepest shadows giving the images a good deal of positive character. Some of them, we learn, which had been a trifle under-exposed, had the usual plan of development supplemented by the aid of ammonia. One negative, which, after developing some time, appeared hopelessly under-exposed, scarcely any trace of an image appearing, was finally washed, dried, and put away in a plate-box until after his return to England, when it was subjected to alkaline development, and finally yielded a capital negative without any appearance of having been forced in development in any way.

Mr. England's travelling equipment for the wet process

is one of the most convenient we have seen. The knapsack tent, made from his own design, is light and commodious; but, although it accompanied him, to be ready in case of emergency during last summer's tour, it was never used, the dry plates never having failed. These were prepared at various places *en route*, some convenient place being selected every now and then to serve as head-quarters for a few weeks, from whence to ramble for a few days, and return to develop the negatives obtained, and prepare more plates. As a rule the plates were developed within a few days of their preparation, but in some cases as much as a month elapsed between the operations.

Mr. England is one of the very few veterans of the art who commenced the practical business of life as a professional photographer. Upwards of twenty years ago, when he was a lad of eighteen years old, he undertook the charge of a Daguerreotype portrait establishment. For many years he has been chiefly devoted, however, to the production of landscapes, especially stereoscopic and instantaneous work. His success in these departments has been most unequivocal, his especial work being unsurpassed by any in the world, and equalled by very few. His views of Niagara, taken under serious disadvantages, upwards of ten years ago, are still the finest views of the grand scenery of the Falls that have been issued. His instantaneous views of the streets of Paris have never been surpassed. His views of the International Exhibition of 1862 were perfect, and, by contrast, give a singular point to the failure in the attempt to photograph the recent exhibition of a similar kind. The Swiss scenery, which for some years has absorbed Mr. England's attention, is executed with a degree of care which leaves nothing to desire. Perhaps the most distinguishing characteristic in all Mr. England's operations is their pre-eminently practical quality. An earnest experimentalist, with a perfect knowledge of all the capabilities of the art, and a liberal communicator of all the results of his knowledge to his brethren, it is well known to all those who have the advantage of Mr. England's friendship, that when he advises a given course, or when he publishes a process, it is certain to be practical and trustworthy. A cultivated artistic feeling characterizes all his pictures; whilst their photographic manipulation is generally absolutely perfect. A scrupulous and conscientious care to secure in all cases the best possible result is manifest. His equipment of lenses to one camera, and for size of picture, includes about a score of Single, Triple, Wide-Angle, and Rectilinear lenses, varying from three inches to fourteen inches in focus, so that every subject may receive such treatment as shall produce absolutely the best result.

Mr. England is one of the few who have already introduced photography to a second generation: his eldest son, a youth of seventeen, has commenced his career as photographer, as a dry plate man, having produced some excellent dry plate negatives, before he has yet produced one by the wet process.

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS. BY H. P. ROBINSON.

CHAPTER XII.

"Nothing is more strange in art than the way that chance and materials seem to favour you, *when once you have thoroughly conquered them*. Make yourself quite independent of chance, get your result in spite of it, and from that day forward all things will somehow fall as you would have them," — *Ruskin*.

"It is often said: Study nature; but nature does not compose; her beautiful arrangements are accidental combinations, and none but an educated eye can discover why they are so. Nature docs, and ought to, supply the materials for fine pictures; but to select and reject, to adapt the individual parts to the production of a perfect whole, is the work of the artist, and this it is that stamps the emanations of genius." — *Burnett*.

THE SKY—continued.

The doctrine lately set forth by the matter-of-fact school concerning the impropriety of using any other sky in a pho-

tograph—or, indeed, as it must naturally follow, in any other picture—than that which was actually presented at the moment of taking the rest of the picture, although of so little importance as to be scarcely worthy of notice, yet demands a few words, as it may have a detrimental effect on the unthinking, or those whose faith is not quite confirmed in photography as an art.

That this doctrine is utterly wrong—a pestilent error, without even a figment of truth to support it—is capable of easy demonstration. It is, indeed, so absurd that the wonder is it should have ever found its way to the light. It would be quite beside my present purpose, or beyond the scope of these articles, to enter into any elaborate discussion upon the point; but it will be enough to remind the student that if the idea be carried out in the manner advocated by the school above-mentioned, it comes to this: any landscape is equally beautiful at all times, and, notwithstanding it may be seen under various aspects, a photograph of it, if absolutely accurate, will, in virtue of its accuracy, be a work of the highest art; so that art becomes no more than a mere servile copying of nature, without even the slightest reference to the aspect under which nature is seen. Can art be thus brought down by men of no minds to such a level? Certainly not. The highest aim of art is to render nature, not only with the greatest truth, but in its most pleasing aspect; to show forth the storm in its grandeur, or to gladden the eye with the smile of nature's light. Truth may be obtained without art. The exact representation of unselected nature is truth. The same of well-selected nature is truth and beauty. The former is not art, the latter is.

I do not shrink from the statement, although Ruskin may be quoted against me, that the highest duty of man is the cultivation and improvement of God's works, and by doing so he cultivates himself.

As an instance of the improvement of the works of nature by man, going on every day, I ask, what is education but the improvement of nature? I once heard an eloquent speaker refer to education as the attainment of the highest truth. Pointing to a rough-hewn block of wood or marble, he said that was natural truth; but polish the rough-hewn surface, and all the delicate grain or markings, the varied veins and gradations before unseen, were now brought out, and a thing of beauty was discovered, which was still higher truth. If we were—following the doctrines of the leave-nature-alone teachers—to abstain from secluding our children to school, what sort of savages would they become! Yet that would be leaving nature to herself. Why, it has been the instinct of mankind from the earliest ages—from the time our ancestors painted themselves blue because clothes were scarce—to improve nature. We may be too highly civilized, but a "state of nature" would scarcely be allowed now-a-days, but would soon attract the attention of the police. On the contrary, the endeavour of mankind is, as it should be, to apply that to nature's greatest work which is calculated—

"Not only to keep down the base in man,
But teach high thought, and amiable words,
And courtliness, and the desire of fame,
And love of truth, and all that makes a man."

But, to return to our immediate purpose, there is comfort for the artist photographer, not only in the quotation from Ruskin, at the head of this chapter, which entirely neutralizes any extract from the same writer to the effect that nature must be slavishly imitated, whether that nature be a pig-stye or a palace, so that it should *chance* to come before the artist, but in the fact that Turner, who in the opinion of that writer and many others could do nothing artistically wrong, or depart in any way from nature, not only improved nature by twisting his views out of all resemblance to the localities they were intended to represent, but actually studied many of his best skies from the end of Margate jetty, and afterwards fitted them to any picture he thought they would suit.

I may here quote an anecdote related by Burnett of Turner which is applicable here:—"Driving down to his house

[Woodburn's] at Hendon, a beautiful sunset burst forth; Turner asked to stop the carriage, and remained a long time in silent contemplation. Some weeks afterwards, when Woodburn called upon him in Queen Anne Street, he saw this identical sky in his gallery, and wished to have a landscape added to it; Turner refused the commission—he would not part with it. Wilkie used to call these studies 'his stock-in-trade.' His skies look like transcripts of nature, but they are the result and remembrances of his contemplation. They are composed of many combinations and changes in the heavens, drawn from the retentive stores of his memory; they are adapted to the picture in hand by the different qualities required. If the subject is indifferent, he trusts to the richness and composition of the sky to give it interest; and if the scene is complicated, and consists of many parts, he makes use of the sky as the seat of repose."

It must be remembered that nature is not all alike equally beautiful, but it is the artist's part to represent it in the most beautiful manner possible; so that, instead of its being death to the artist to make pictures which shall be admired by all who see them, it is the very life and whole duty of an artist "to keep down what is base" in his work, to support its weak parts, and, in these parts, which are subject to constant changes of aspect, to select those particular moments for the representation of the subject when it shall be seen to its greatest possible advantage.

I have not in this article advocated the use of artificial skies, or painting in skies on the negative, although I believe in the legitimacy of either method, and it is the constant practice of our best landscape photographers—Bedford, England, Mudd: need I mention more?—to improve their negatives in the sky and other parts with the brush. I have not done so, because I believe the natural sky, added from a separate negative, to give the most complete results; but I see no reason whatever why the negative should not be improved, if it is found necessary, without any departure from truth.

Before photography was discovered, artists used to paint skies to their pictures; indeed they then, as now, painted their whole pictures; but now that photography has asserted its claim to mechanical accuracy in its transcripts of nature, there has sprung up with it a class of men who would have us believe that to touch a photograph with a paint-brush is almost the greatest sin a man can commit, and they would hardly shrink from even taxing a man with immorality and want of religious principle who, having taken a good photograph, should, by a few strokes of the pencil, judiciously applied, make it, as well as a good photograph, a good picture.

In conclusion, I cannot refrain from quoting part of a letter on the sky in the PHOTOGRAPHIC NEWS, September 22nd, 1865, by an admirable writer, who, under the *nom-de-plume* of "Respite Finem," favours us too seldom with his views on our art; after which let us turn from these vain janglers to the consideration of something more profitable.

"The clouds have to play a far more important part in photographic landscapes than they have yet done. I do not say that a photograph without a sky, or with a mass of white for the sky, is altogether unnatural, but, to me, it is very tame, insipid, and unpoetical. How a photographer with a conception of the enormous resources he possesses in the clouds can ever neglect them in his landscapes I cannot understand. They have such a varied beauty in themselves; they give to the artist such a command in balancing and harmonizing his composition; if well managed, they so assist everything else in taking its place, that I cannot understand their frequent neglect by the photographer. One reason is, I know, the difficulty of securing them in the same negative as the foreground. If I am right in my former letter on the legitimacy of combination in photography, then there should not be a second opinion as to the propriety of using a second negative, looking to it, however, that the clouds harmonize with the picture and involve no impossibility or practical solecism. To avoid this a careful and

constant study of nature, as well as art, will be necessary. Heed not, I would say to the photographer, the thoughtless objector, or bogus critic, who tells you that the landscape can only harmonize with that sky with which it was illumined when you obtained your negative. Remember that the portion of the sky which produces lights or shadows on your landscape is rarely that which the eye sees in looking at that landscape. How far this is true you will ascertain by the study of nature; and of all the studies of beauty known to man, there is none so grand, so lofty, and so varied as the study of the aspects of the sky and the glories of the clouds. And when, with Ruskin, you have gazed on a glorious sunset, 'through its purple lines of lifted cloud, casting a new glory on every wreath as it passes by, until the whole heaven, one scarlet canopy, is interwoven with a roof of waving flame, and tossing vault beyond vault, as with the drifted wings of many companies of angels; and then, when you can look no more for gladness, and when you are bowed down with fear and love of the Maker and Doer of this, tell me who has best delivered his message unto men.'

JOTTINGS ABOUT PHOTOGRAPHIC COPYRIGHTS.*

The numerous prosecutions lately instituted by Mr. Graves against dealers in photographic scraps, &c., have caused much attention to be given to the subject. We have, therefore, collected a few jottings pertinent thereto, believing that they will be perused with interest.

In 1735 William Hogarth obtained an Act of Parliament (8 Geo. II., c. 13) which gave him copyright in his original engravings for fourteen years from their first issue. Infringement of the copyright subjected the infringer to a fine of five shillings for every copy possessed, and forfeiture of the piratical plate. The penalties were, however, to be sued for within three months. As this Act only afforded protection when the designer and publisher was the same person, it was inoperative when one person designed, or engraved, and another published. To remedy this defect another Act was passed in 1767 (7 Geo. III., c. 38), which extended the copyright to printsellers or others who should employ designers to work for them. It also enlarged the period of copyright to twenty-eight years, and permitted the penalties to be enforced within six months after the commission of the offence. This Act, however, omitted to include those persons who should illegally sell, or expose for sale, any pirated copies; and a similar omission was made in a subsequent Act (17 Geo. III., c. 57) passed in 1777, the effect of which was exemplified so recently as November 9th, 1862, when Mr. Currie, at the Bow Street Police Court, decided that Mr. Sydney Powell, who appeared at the suit of Mr. Gambart, had not, by selling copies of Rosa Bonheur's celebrated painting of "The Horse Fair," infringed the Act. In 1836 the provision of the previous Acts were extended to Ireland, and in 1852 to French prints published in this country; but such prints must be registered at Stationers' Hall within three months after their first publication in France. By the Act (25 and 26 Vict. c. 68) which came into force on the 29th of July, 1862, a copyright was given to artists and their assignees for the life of the author, and for seven years after his decease, in all paintings, drawings, and photographs, first produced after the enforcement of the Act. By a strange omission, however, engravings are not mentioned, though there can be no doubt that it was intended by the legislature to include them. Still, however, dealers should use care, as engravings may be, and most probably have been, photographed, and the photographs registered at Stationers' Hall, as was done by Mr. Gambart before he published his print of "The Derby Day."

Considering the difficulty, therefore, that exists in discovering what is copyright and what is not, it appears surprising that the retail tradesmen did not better support a "Protection Society," that was some time since especially established for their behoof, particularly as one of the principal objects of the association was to keep its subscribers "posted up" in all the doings of their trade.

For our own part we believe that print publishers do not sustain pecuniary loss by the reproductions in large numbers

of small photographed copies of their works; while we opine if they would themselves publish such series, a large sale and corresponding profits would accrue. And a similar view of the case is taken by the *Athenæum*, than which there has not been a greater advocate of the rights of authors in both literature and the fine arts. Our contemporary on this subject says:—

There appears to be strong grounds for believing that if judiciously used such photographs would give great publicity to and largely increase the sale of engravings, when the prevailing false and vicious system as to *proofs* has been abandoned, and the print-selling trade put upon a true and sound basis. If every publisher were to publish a complete set of small photographs of all his engravings, including all the title and other inscriptions, they would not only operate as the best possible advertisements of the engravings, but likewise do more than anything else to prevent the mischief now complained of. The publisher would not merely be able to undersell the alleged pirates, but also effectually stop their sale: for what tradesman would be insane enough to purchase spurious copies with the chance of exposing himself to legal proceedings, when he could escape that danger by only dealing in authorised copies obtained directly from the publisher or his agents? If it be objected on the part of the publishers, that spurious copies of photographs may be easily and inexpensively reproduced, the answer is that the judicious use of a *trade mark*, which may be of any size, will materially contribute to protect the property in copyright photographs as well as in engravings.

There are, of course, two sides to every question, and in answer to the foregoing hypothesis the print-publishers say they know from experience that cheap issues materially injure the sales of the originals, in proof of which Mr. Gambart asserted in 1862 that "The Horse Fair" and "The Light of the World," which had at one time realized £1,000 each per annum, were not at that time producing a tithe of the amount, a result, he assumed, that had its rise in the number of pirated copies that had been issued. The publishers also affirm that they have no right to diminish by acts of their own the value of the engravings they have disposed of. And further, that collectors who pay large prices for choice engravings do not care to see copies sold at one-hundredth part of the published price. They also argue that if prints were to be issued at one guinea instead of from five to fifteen guineas, a sufficiently large number of good impressions could not be struck off; and, that as framing a large engraving costs from four to eight guineas, the price would still be beyond the means of the major portion of the middle classes. There is yet another class of pirates that the publishers claim to be much injured by, but against whose practices they have no redress; viz., amateur photographers, who get possession of an engraving, copy it, and, for the mere purpose of showing their skill, present copies of the work to their friends, who are possibly persons of means, and well able to purchase the original prints. Again, they state that pirated photographs are rapidly ruining the line engravers, who cannot now find sufficient employment. At one period popular plates were engraved and re-engraved according to the demand, but since the advent of photography the cost of once engraving barely remunerates the publisher.

There is undoubtedly some truth in what the copyright owners say, though we do not give credence to all their pleas; and while they are so remarkably averse to the doings of piratical photographers, they are not ashamed to impose upon the public a number of what they term "proof" impressions. In fact, instances are known where the number of *proofs* has considerably exceeded that of the published impressions. Such a circumstance is not honest, and the public wants as much protection against the impositions of the print-publishers as the latter once did against the much maligned pirates. The same man who would be ashamed to rob anyone of sixpence, nevertheless is willing to salve his conscience with the flattering unctious that the tricks of his trade are legitimate, albeit he has imposed upon a customer, and actually obtained from him, by false pretences, a sum of many pounds, by representing as "proofs" those which are simply impressions! Believing there may be some misunderstanding as to what "proofs" really are, it may be well to mention that they *should* simply be early copies, that are struck off on fine, or India, paper, before publication, to enable the engraver and publisher to test the accuracy of the work. But when the plate is finished, and we have the authority of Mr. Joubert for stating so, it is customary for the engraver to receive as his "right" two-thirds of all proof impressions actually printed before the delivery of the plate to the publisher, though we have no index as to the number of dozens to which the said "right" extends.

We have perused numerous accounts of trials, both civil and criminal, against persons who have infringed the Copyright Acts. In some of these the plaintiffs have sought to assume special damages in consequence of the sale of piracies of their

* The Stationer.

works, and have produced witnesses to prove that since the piracies were issued, the sale of original copies has fallen off. In the case of *Gambart v. Slater*, tried in the Sheriff's Court, one Mr. Ginger, of Canterbury, swore that he had procured £70 worth of orders for the "Light of the World," when it first appeared, but that afterwards he could not find buyers. Surely this assertion did not prove anything? Every book-publisher knows that the sale of each work is greatest when first issued, and that it gradually declines. And of course it is so with prints. Had Mr. Ginger stated that he had continued to be as successful in finding customers as he was when the print first appeared, we should have disbelieved him. It is, however, only fair to Mr. Gambart to state that so convinced was he of the loss he sustained by having his works pirated, that in 1864 he purchased certain pictures without the copyrights, because he considered the latter useless to him; and in the same year, writing upon the subject, he remarked:—

I withdraw from an industry in which some people think I have rendered some service to art and artists; I do not deem it advisable to waste more capital on property which I am unable to defend, and I am driven out of a lawful business by the evil proceedings of others.

Before concluding our remarks respecting "The Light of the World" and its assumed depreciation, it is not unworthy of notice that Mr. Gambart found it to his interest to re-engrave and publish a smaller copy of the work in question.

Some time ago Mr. Ordish was summoned at the Guildhall for selling a copyright carte-de-visite of Miss Lydia Thompson, but Alderman Carter dismissed the summons on the ground that the defendant had acted in ignorance. The law presumes that every man ought to know when he commits an error; and if the worthy alderman did not decide exactly in accordance with judicial tradition, he took a common-sense view of the case. And we believe that many poor country tradesmen who have had "to pay the piper," through selling piracies in ignorance of their liability, would have done better by appealing to a jury than by showing the white feather, and paying a sum of money to stay the proceedings of their prosecutors. It is only a comparatively few months ago that a great number of newsvenders in the country had actions brought against them at the suit of Moore, M'Queen, and Co., and Ernest Gambart, for selling copies of "The Return from Hawking" and "A Distinguished Member of the Humane Society," which had been given away by the publishers to the subscribers of *Bow Bells*. Much annoyance was caused in consequence to very poor people, and in the Thames Police Court it was stated that from a needy widow, living in a by-street, £12 were demanded for compensation, though the total number of copies she sold was only twelve, and from which the profits realized amounted to just fourpence. This was indeed practising the *lex talionis* with a vengeance!

Messrs. Graves and Co. suggest that as some 700 pictures are annually exhibited at the Royal Academy, there must be many of such worthy of being reproduced; and they propose that a public company should be established for the purpose of disseminating "cheap art." The hint is not altogether a bad one, and we have no doubt that many artists would, for a fair consideration, permit their paintings to be photographed, and copies of them to be sold. But then the difficulty arises of getting good negatives from pictures, as the effect produced by pigments is generally blotchy, and lacks that defined sharpness which is obtained from engravings. In France, however, this difficulty is overcome. There the artists and photographers work in harmony. The former first prepare their designs in sepia, and from these the latter work, while the colours are subsequently added by the painter.

In speaking of the law of copyright, Lord Mansfield said:—"It is certainly not agreeable to natural justice that a stranger should reap the beneficial pecuniary produce of another man's work." And in this expression we fully coincide. As the law, however, exists, there is no direct means to discover what prints and what photographs are copyright. Dealers in such goods may therefore very innocently transgress the law, and subject themselves to heavy penalties; particularly so at the present time, when unscrupulous men are employed to tempt unwary people to buy, and still more unscrupulous individuals are willing to tempt the before-mentioned purchasers to sell. There is a great demand now existing for photographic pictures, and we think the print-publishers are doing a moral wrong, firstly, by not endeavouring to satisfy the public requirements; and, secondly, in omitting to issue details of those goods in which they claim a copyright. Trading in

photographs is now very hazardous, and we advise dealers to be chary as to their proceedings, and to purchase only of established firms of good repute, conditionally that the said firms will hold them harmless in any ulterior proceedings that may be taken against them in respect to their dealings in such goods. There are many works represented as copyrights that are not such, while there are numerous plates concerning which there is much doubt. These circumstances cause much difficulty to even the most experienced persons connected with the trade; and as reliable evidence is not always attainable, errors are unwittingly made. The existing position of the scrap trade is, therefore, so unsatisfactory, that we think legislative interference is requisite. If a person publish a book, there are, by reason of the many indices that are issued, means of finding out the nature and title of the work, while the volume may be readily seen and perused at the British Museum. With works of art it is different. An individual may desire to reproduce a particular design in photography. If, however, he exercise all his personal ingenuity in endeavouring to discover whether any copyright exists in it, he will probably fail to secure correct information. At Stationer's Hall he will not learn anything unless he know the name under which the design has been entered, while even if this be known, the description may be so ambiguous that he will fail to recognize it as referring to the work he wishes to reproduce; for be it known, that it is not requisite on registration to supply a copy of the work desired to be protected. We therefore suggest the establishment of a museum of art, which should be open to all persons wishing to make inquiries respecting copyright, and where photographs should be kept of every protected work, whether statue, painting, print, or photograph. Such an establishment would probably be more effectual in putting down piracies than have been the late criminal prosecutions, as it would wholly prevent pleas of ignorance or other illusive excuses being made in extenuation of error.

Certain judicial decisions recently given have caused much consternation among the dealers. Fines of £250 and £130 and expenses, irrespective of civil proceedings at law, are not of every-day occurrence, and may well strike terror into the camps of the pirates. Whether the decisions arrived at by the magistrate were, or were not, right we shall not discuss, though we consider they were cases in which leniency might have been shown. We do so because it was proved in evidence that the prosecutor's spies tempted the defendants to procure particular goods on the faith of certain representations, and an old maxim states that "the tempter is worse than the thief," though we do not believe that the last word of it is any way applicable to the defendants. They were not dealing in the piracies, and the spies, finding out such to be the case, made tempting offers, and, poor human nature not being infallible, the scouts succeeded in hunting down their game. They did not, however, bag them at once, but let months roll away, and when their victims had almost forgotten the circumstances of their delinquency, the avenging summonses were issued. If several persons combine together for the purpose of inducing others to commit legal offences, it appears to ourselves very much like a conspiracy. In all cases, therefore, where prosecutions are instituted on the evidence of hired temptors, or spies, we would award the very lightest punishment that the copyright law allows. R. H. M.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual Monthly Meeting was held in the City of London College, on the evening of Thursday, April 9th, the Rev. F. F. STATHAM, M.A., in the chair.

The minutes of a former meeting were read and confirmed.

The CHAIRMAN announced that the presentation prints selected for the present year were "Going to Markot," 16 by 12, by Mr. H. P. Robinson, printed in carbon, and a whole-plate picture by Mr. Rejlander, entitled "Homeless," printed in silver. He also called attention to a circular inviting photographers to contribute to a fine art exhibition at Darwin, in Lancashire.

The officers for election at the Annual Meeting in June were nominated.

The CHAIRMAN then announced that the evening having been set aside for the examination of photographs and conversation thereon, he would be glad if the members would place before the meeting the examples of the art they had brought with them.

Mr. COCKING (Hon. Sec.) exhibited three portraits, 10 by 8, possessing the characteristics of great richness, force, and depth seen in most of M. Salomon's portraits. All the pictures displayed much artistic feeling: one, of a gentleman, taken under somewhat difficult circumstances as to light, &c., was exceedingly fine and vigorous, possessing excellent gradation and modelling, and unusually fine rendering of light and shade. Mr. Cockin also exhibited a family picture, consisting of father and mother and fifteen children, mounted in the spaces left in an illuminated design which he had prepared for the purpose.

Mr. WHARTON SIMPSON exhibited examples of the work of M. Adam-Salomon, of Paris, and of Mr. Notman, of Montreal, done in a similar style; also of the work of Herr Milstor, of Berlin, and some examples of American carbon printing, all of which were much admired.

Mr. BOOTY exhibited some interesting landscapes, amongst which were some interesting snow scenes and some good cloud effects, obtained by giving a graduated exposure, the foreground being uncovered much longer than the sky.

Mr. DALLMEYER exhibited a large selection of Mr. England's charming Rhine pictures taken on dry plates; of Faulkner's portraits of children; of Mr. Russell Manners Gordon's exquisite landscapes; of Mr. Rojlander's art studies; and some other pictures, all illustrating the qualities of his various forms of lenses.

Mr. BLANCHARD exhibited some remarkably fine, massive portrait studies, and some architectural pictures taken with Dallmeyer's wide-angle Rectilinear lens. He explained, in reference to a view of Cannon Street Station and Hotel, that it would have been impossible to have secured the picture with any other lens, on account of the contracted situation. The view in question was taken from the opposite side of the street, and although the perspective was somewhat exaggerated by taking such a large picture with a lens of such short focus, he considered such a lens an invaluable addition to the photographer's stock of apparatus, enabling him to secure many valuable pictures before beyond his reach.

Mr. ENGLAND said that many of the pictures he then exhibited were taken with the rectilinear lens, and could not have been taken without it—that of Cologne Cathedral, for instance, which had never been taken before, its contracted situation rendering it impossible with ordinary lenses. This picture, although of cabinet size, was taken with a lens of 4½ inches focus. In using such a lens he avoided, where he could, such a point of view as would render the exaggerated perspective very apparent.

Mr. DALLMEYER pointed out the importance of employing special lenses for special uses, and of avoiding the wide-angle and short focus lenses for ordinary purposes. Whilst he had endeavoured to meet the wants of photographers by giving them instruments to suit occasional and special necessities, he would recommend that for ordinary purposes a lens including about 54° should be used, which would give results natural and true, without any appearance of false perspective.

Mr. HUNTER exhibited a large and interesting collection of the photographs of the Amateur Photographic Association.

Mr. WALL exhibited a print from a negative in which an etching-needle had been used to modify the detail in the accessories and background, and also some examples of a method of producing, by photography, blocks for surface-printing from copies of engraving.

Mr. WERGE exhibited an interesting series of pictures illustrating eight distinct types of photography. Mentioning them alphabetically rather than chronologically, they were the Ambrotype, or collodion positive on glass; the Calotype, or paper print, by Fox Talbot's method; the Chrysotype—one of Sir John Herschel's processes—in which the sensitive surface was prepared with ammonio-citrate of iron, and developed with gold; the Cyanotype, another of the processes of Sir John Herschel, in which the image was produced by the aid of prussiate of potassium; the Daguerreotype, a portrait of the wife of Daguerre, taken by himself; a Diaphanotype, which was a paper print made transparent, and coloured at the back in oil; a Ferrottype, or Collodion-positive, on an enamelled iron plate; and an Ivorytype, or paper print, coloured on the surface in water-colour, and rendered transparent with wax, so as to re-

semble a tablet of ivory. Mr. Werge also exhibited a print on albuminized paper, printed twelve years ago, which was in very perfect condition, showing no fading or change of colour. It was washed as described at a recent meeting by Mr. Werge.

After explanation and examination of these and other prints, the proceedings terminated.

LONDON PHOTOGRAPHIC SOCIETY.

THE usual Monthly Meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of April 14th, Mr. J. GLAISHER, F.R.S., in the chair.

The minutes of a previous meeting were read and confirmed.

The CHAIRMAN said that Mr. Mayall had kindly promised to add to the list of presentation prints already announced by giving each member a photograph, the subject of which remained to be decided by the council or the donor.

Mr. GRIGGS then proceeded to read a paper on Photolithography, and the application of Photography to Chromo-lithography, describing in detail the process employed at the India Museum in producing the designs of textile manufactures and other art industries for distribution amongst the manufacturers of this country. A salient difference in his operations to those usually employed in the recognized processes of photo-lithography consists in the fact that he washes his transfer with cold water instead of boiling water. An especial interest was communicated to the proceedings by the practical demonstration of the operations which was afforded, Mr. Griggs, with the aid of an assistant, printing, in presence of the meeting, certain impressions from two stones forming the design of a turban piece. He also washed off a transfer before the meeting, placed it on the stone, rolled it up, and distributed a few impressions among the members.

The CHAIRMAN called attention to some excellent examples of photo-chromo-lithography Mr. Griggs had placed at the disposal of the Society for presentation to members as examples of the kind of work he had described, and the mode of producing which he had demonstrated. Members would receive the prints at the close of the meeting, on application to the Secretary. He also called attention to a fine collection of views on the Rhine, produced by Mr. England on dry plates; and to a number of fine examples of the Eburneum process, produced by Mr. John Keene.

Mr. MAYALL expressed his personal thanks to Mr. Griggs for the reading of one of the most interesting papers, accompanied by the most satisfactory illustrations, that they ever had the pleasure of witnessing. He was deeply impressed by what had been brought before them, of the immense strides which photography was making as a handmaid to manufacturing art; he had scarcely been prepared to expect that photography should be made the agent of distributing the splendid designs of the textile fabrics of India to every manufacturer in this country, rendering them with a degree of accuracy which gave the value of technical pattern for actual guidance in work. The manufacturers of Manchester and Paisley must at once see the importance of guides so accurate and perfect, and the result must be beneficial in our art industries. This was an illustration of how photography might be made valuable in cultivating our workmen in connection with all industries involving the art of design; and he hoped to see the admirable productions of the middle ages, the works of Cellini and others, made familiar by a similar means. He hoped, too, that the manufacturers of this country, availing themselves of such aids to design, would send back to India fabrics which should illustrate their triumphs in manufacturing industry. Doubtless Mr. Griggs' process would have many valuable applications, especially in chromo-lithography. He should like to learn from him if these designs could be produced in cylinders, so as to fit for the purpose of the calico-printer, where it might probably be of incalculable value. He foresaw immense advantages in this respect, in the designs of the fabrics produced in our cotton districts, when true art being wedded to manufacturing industry, the two going hand in hand, aided by such appliances as Mr. Griggs had brought before them. All true art required the devotion of a life study to give it value, and in proportion as true art could be multiplied and popularized it would drive out the bad art which was only too common. The process illustrated to-night would give currency to the productions of such men as Albert Durer and others of a high class. It was too true that we were, in this country, behind the rest of Europe in the arts of design. He

had had the pleasure of examining the great book opened in Paris last year—he meant the International Exhibition—in company of four of the master minds of this country, of which Sir Charles Wheatstone was one, and they were painfully struck with the inferiority of this country in the arts of design: with manufactures which might enable us to clothe the world, we had yet much to learn in this respect. He hailed, therefore, with great delight every agency which should advance us in this respect, and enable England to maintain its position in the progress of art and industry, and preserve its superiority in our time, as it had in bygone ages.

In answer to a member as to what were the essential features in this process differing from that of Sir Henry James, Mr. GRIGGS said that the essential point was the fact that he washed away the superfluous matter from the transfer with cold water, and Sir Henry James with hot water. By doing this Sir Henry James removed all the gelatine as well as the ink from the lights; whereas he (Mr. Griggs) only removed the ink, leaving the gelatine, which gave him an advantage in transferring, the gelatine causing the print to adhere to the stone, without risk of moving, when passing two or three times through the press in transferring. His paper also received a preliminary coating of starch. In answer to Mr. Mayall, he thought that there would be no difficulty in transferring impressions on to a cylindrical rollers.

Mr. PETER LE NEVE FOSTER, in answer to some remarks, said that the essential distinction between the transfer of Mr. Griggs and Col. Sir Henry James was, that the latter removed everything, both ink and gelatine, from the transfer, and Mr. Griggs removed the ink only, leaving the gelatine in the lights.

Mr. MAYALL thought Sir Henry James' process was excellent for maps, but it struck him as scarcely equal to Mr. Griggs' for artistic purposes, the latter having more delicacy.

Mr. GRIGGS did not wish to make claims to superiority, but his aim in leaving the gelatine was to support the fine lines, as when they were left in relief and all gelatine removed, they were apt to break down under the pressure of transferring.

The CHAIRMAN, in a vote of very hearty thanks to Mr. Griggs for his interesting and practical paper, said that every one was indebted to Sir Henry James for having so early published his process in a blue book, and so prevented it being locked by a patent, which it would otherwise have been. The process of printing in various colours was, in his own estimation, of peculiar interest, on account of the nicety and mathematical accuracy necessary in securing the register of the prints produced from such a number of stones. He felt sure they would heartily thank Mr. Griggs for his paper and for the valuable practical demonstrations.

The thanks were expressed by acclamation, and were duly acknowledged by Mr. Griggs.

The CHAIRMAN then read the following letter on the subject of Mr. McLachlan's discovery:—

“Dr. Hugh Diamond, Honorary Secretary of the Photographic Society.

“SIR,—We have the honour to report that on the 12th February last we met Mr. McLachlan by appointment at the rooms of the Society of Arts, and that he then explained to us the principles of a scheme of photographic practice by which he claims to have excluded many difficulties and sources of failure in the production of collodion negatives. Mr. McLachlan attaches great importance to the selection of particular qualities of certain photographic chemicals, samples of which have not, however, been submitted to us.

“Without such aid to guide us, experiments were conducted at Woolwich with the ordinary materials, and we succeeded in realizing some of the conditions promised by Mr. McLachlan.

“The question as to how far the permanence of the bath and uniform working of the collodion and other chemicals may be guaranteed according to this plan must be left for future experiment to decide.—We are, sir, yours &c.,

“P. LE NEVE FOSTER, M.A.

“JOHN SPILLER, F.C.S.”

The CHAIRMAN then said that Mr. McLachlan had come from Manchester that day purposely to communicate to the members of the Society his valuable discovery, but it was unfortunately too late to go fully into it. He would ask him to give them briefly some information as a preparation for the paper he promised to read next month giving fuller information.

Mr. McLACHLAN said that as what he had to communicate

was the result of almost a lifetime of experience to which almost everything else had been sacrificed, he could only very partially enter into the subject in the short time then possible. He had been led to examine the subject from his experience, which resembled that of all photographers, namely, that things would work well for a week, and then, for a week or two more, almost everything would go wrong. As they were using the same things it was clearly a question of condition of the chemicals, which, if kept in a proper state, ought to guarantee immunity from all failures except those of manipulation. After briefly stating the common practice in photography, and its uncertainties and troubles, he said his aim had been, then, to prepare his bath and his collodion so that pure iodide of silver would be formed in the film in equivalent proportions, without the disturbing influence of acid, which tended to separate the iodide from its base. He had succeeded in preparing a bath without acid, which could not be charged in excess with the fatal source of pinholes—iodide of silver—which, while holding oxide of silver in solution, would not fog the plate. Then he prepared collodion to suit the bath, and for convenience he modified commercial samples. As usually sold, all collodions were made from cotton prepared with an excess of sulphuric acid: they contained an acid, not sulphuric acid, but something analogous to it; this caused streaks, brain-markings, &c. It was held by photographers generally that nitrate of silver was not altered by light. Now he found it was altered, and this was an important element in his conclusions. His method was as follows:—He took crystallized nitrate of silver, not the recrystallized. By preference he used a black-looking sample, which was generally rejected; it seemed moist and dirty, and appeared to contain a good deal of the water of crystallization. Members could best judge of what he meant by examining the sample he now exhibited. With this he made a bath, at the rate of one ounce to one ounce of pure distilled water. Taking six ounces of solution so prepared, and putting it out in a 40-ounce bottle to the action of light, he left it as long as he could. He preferred three months of the warmest and sunniest portion of the year; but one month, or even less, would do a good deal. If the water and silver were pure and neutral, no apparent change would take place; if the solution were made either acid or alkaline, the effect of light was considerably limited. Now, to test the change effected, he made a solution of caustic potash, 1 grain to an ounce of distilled water. If a drop of this were added to an ounce of the silver solution before it were sunned, a turbidity would be caused by the precipitation of oxide of silver; but after the sunning, on adding the potash solution, the bath would have been found to have acquired the property of holding oxide of silver in solution; and although a considerable quantity might be formed, it was redissolved, and the solution remained clear after shaking up a little. Practically, he only added 1 drop of potash solution to 1 ounce of silver solution, so as just to secure a slightly alkaline condition. He then took 2 grains of iodide of potassium and dissolved in a very small quantity of water, say 10 minims; this he added to 10 or 12 minims of the strong silver solution, which was then diluted to the strength of 35 grains to the ounce, and, singularly enough, no precipitate of iodide of silver was formed on dilution, nor would any indication of the presence of excess of iodide of silver be present on working. After the lapse of a few days, however, a curious change took place: the iodide of silver was all precipitated suddenly, and after that, no matter how much water was added to dilute the bath, no turbidity or apparent presence of iodide of silver was produced. This was the bath in perfect working order, slightly alkaline. He next prepared a suitable collodion; and, for simplicity, he would mention one excellent sample of commercial collodion—he referred to Mawson's. He would take this in a ripe, red, acid condition. If used in the bath as prepared, it would give brain-markings and stains, because of the antagonism of conditions. It must be made to harmonize with the bath. He therefore took the potash solution and added about 4 drops to a 5-ounce bottle of collodion; this neutralized the acid, making the collodion nearly colourless; and this neutral collodion employed in this alkaline bath would give clean brilliant negatives without a trace of fog, at once delicate and vigorous. He required, however, for the best result, a suitable developer. For this he preferred the common dark green dirty-looking protosulphate of iron. But as it was often more difficult to get this than the clean, pure, light green crystals, he would describe his mode of making the developer with the pure sulphate. He took 16 ounces of a 12-grain

solution, and added to it 5 drachms of methylated alcohol; he placed the bottle containing this on a piece of wood in a saucepan of cold water, and allowed it to come gently to a boil, continuing the boiling for about ten minutes. To this he added $3\frac{1}{2}$ ounces of glacial acetic acid, and then filtered; this flowed over the plate evenly at once, and gave admirable results. With the common sample of iron he made a similar solution, but he added to 1 ounce of alcohol 2 drops of the potash solution, and of this alcohol added 5 drachms. In this case the solution should be warmed, but need not be boiled. The same acetic acid would of course be added. Mr. McLachlan gave many explanations and cautions, but we have here endeavoured to present the salient parts of his operations until he have opportunity of doing himself full justice in a written paper.

A vote of thanks was passed to Mr. McLachlan, and Mr. MAYALL proposed that a committee, consisting of Mr. Bedford, Mr. Sebastian Davis, and Mr. H. P. Robinson, be formed to work experimentally with Mr. McLachlan, and report.

The CHAIRMAN said the Society could scarcely appoint a committee which should in any way control Mr. McLachlan in selecting his own mode of putting the matter before them, but that he would doubtless be glad to receive the assistance of those gentlemen.

Mr. MAYALL explained that his aim was to give weight to Mr. McLachlan's statements by experimental confirmation; and it was arranged that the gentlemen named and Mr. Mayall should further communicate with Mr. McLachlan.

After a few further remarks the proceedings terminated.

Correspondence.

PHOTOGRAPHY AND DISEASE.

SIR,—I have often been pleased with the interest taken by you in the personal welfare of the followers of the art of photography, no matter whether professional or amateur, proficient and highly successful down to the veriest tyro; all alike have your sympathy; candidly and truly do you advise with your readers.

Well, now, you recently opened your columns to discuss the subject of the health of photographers; and that subject, one of the most vital to every human being, has for many years been ever present to my own mind, sensible as I have always been that I was practising a business that was, in its very nature, prejudicial to my health unless I exercised great continued care. I have always exercised care, and, with the blessing of God, I have had my reward. I am an old photographer, and I may say that I am not a young man—over 50. I do not boast, but state simply as a fact that I enjoy robust health. For this blessing I am thankful. From the days of Daguerreotype I have led an industrious and energetic life, and hundreds of times, at the end of a hard day in the glass house and dark room amongst heat and chemicals and excitement, I have been thoroughly exhausted; but I have lived out of town (I am a photographer in a large provincial town), and intend to continue to do so. After business is over, my plan is to take the 'bus, if tired or bad weather, and get away into the country to my residence, which is well ventilated, and where we have an abundance of fresh air; of that fresh air I have a good drink before I return to business next morning. I am thoroughly refreshed mentally and physically, and am ready buoyantly to face either customers, chemicals, or anything else in reason. I may say that, although not a teetotaler, I am a very temperate man, and make it a rule not to drink intoxicating drinks during business hours. I take a very light lunch at mid-day, and after business is over I make a substantial meal. In conclusion, I may say that I cannot see how a photographer can expect to have good health, or, any how, robust health, when, especially in large towns, he "lives on the premises," carrying with him to bed the fumes of the cyanide and other poisonous drugs, permeating and clogging the whole system, and rising next morning unrefreshed, restless, enervated, and almost lifeless. Is not this the case with many of our brothers in photography?—I am, sir, yours respectfully,
YORKSHIRE.

SOME DRY PLATE HINTS.

SIR,—If the following hints are of any use to the photographic world perhaps you will allow them space in your valuable columns.

I have for some time been using England's dry process with the greatest success, and am only too glad to bear testimony to its value. I have used the formula laid down in your YEAR-BOOK approximately. In the albumen, I have varied the proportions of water, using half-and-half, and sensitizing with from 30 to 10 grains of silver, according to the temperature of my operating-room. As I have never found any difference caused by the heat during exposure, even though the plate be kept a month in hot weather after being sensitized with the 30-grain solution, I have used collodion bromized with from 2 to 4 grains of bromide, and with the latter have found that the plates absolutely improve with keeping up to a month; and that in no case deterioration takes place in them for three weeks. I have also found that the exposure given to the plate signifies little, so long as it has between three times and six times the exposure necessary for wet plates. Below or above these points the negative is under or over-exposed. In the south of France, where I am at present residing, the houses suffer from the "no tap" system, the French seemingly having an objection to more than the smallest quantity of water inside their habitations. I advise speculators in water works schemes to have nothing to do with those that may be proposed for the towns out here). This is a serious drawback to the pleasant preparation of these plates. I have adopted the system in consequence of washings in trays partly. I coat, sensitize, and lay the plate in a dish of water, face upwards; coat, and prepare another; take the first plate out of the water, swill, albuminize, and sensitize as usual; swill, lay in a dish with sloping sides, face downwards, till the next plate is ready to take its place; swill again, and set up to dry. Pictures are always much more satisfactory if development ensues before thirty-six hours after exposure. I have found that the negatives, after a longer interval, are weak, as a rule. The coffee process is very sure, but the exposure is too long to please me, being eight to ten times that of wet. The negatives obtained by it are very good, but the right amount of washing is important to be attended to; extra washing diminishes the sensitiveness amazingly.

In conclusion, let me recommend a receipt for using up the yolks of the eggs used for the albumen:—To two yolks add one glass of sherry and one of milk; beat up well with powdered white sugar, a little nutmeg, and a teaspoonful of brandy. The mixture taken internally before commencing adds materially to the good preparation of the dry plates, and a similar dose afterwards is not amiss.—I am, &c.,
R. E.

April 10th, 1868.

Talk in the Studio.

PHOTOGRAPHY AND THE ABYSSINIAN EXPEDITION.—The official report of Lieut.-General Napier in regard to the operations of the Abyssinian Expedition states that the photographers of the Expedition have been employed in photographing plans and views, as well as surveys of the route onwards, prints of which are handed over to the commanding officers of corps previous to the march.

PHOTOGRAPHIC IDENTIFICATION.—A singular instance of doubtful identity has recently occurred, in which even a photograph was insufficient to give certainty. The body of a man was discovered in a newly-built house at Hackney, and in regard to which the curious difficulty of identification has arisen. Two medical men identify it as the body of an escaped lunatic named Heasman, and his brother confirms their statement. A lady identifies it as another person, her missing husband, and her two sisters confirm her identification. Another lady produced a photograph of a missing relative, which bore a far more striking resemblance to the deceased than did either of two photographs subsequently shown by Mr. Heasman as those of his brother. The incidental circumstances seemed, however, to give the most weight to the supposition that the body was undoubtedly that of Heasman the escaped lunatic.

ANTIDOTE FOR CYANIDE.—The injurious effect on the skin produced by cyanide of potassium in electro-plating establishments is completely arrested and ulcerous sores prevented by anointing the hands with a mixture made by incorporating protosulphate of iron in fine powder with linseed oil.

To Correspondents.

PUNJABEE.—It is not difficult to cover a stout wire with gutta-percha to form a dipper, but it requires constant observation to see that no portion of the gutta-percha gets removed, so as to bring the metal into contact with the silver solution. Take a strip of thin sheet gutta-percha, wide enough to meet round the wire, soften by immersion in boiling water, dry carefully, then envelop the wire, making the edges wrap over a little. The flame of a spirit-lamp or a piece of hot metal will then melt the edge of the sheet sufficiently to make it adhere like a soldered joint: or, another, and perhaps better, plan consists in taking the thin sheet gutta-percha like thin paper, and cut into narrow strips; heat the wire, and wrap round the gutta-percha spirally. When once covered, pass it through the flame of a spirit-lamp, and with moistened fingers press it down to cause all the edges to join. Repeat this process until a sufficient covering is secured. As a rule, we prefer glass dippers, as they are most easily made, most easily repaired, and under no circumstances injure the bath. If a little gutta-percha or india-rubber be attached to the bottom, the risk of knocking out the bottom of a glass bath is avoided.

SCIENTIA CUM ARTE.—The yellow spots in the print enclosed are undoubtedly due to imperfect fixation. Vignettes are much more subject to risk of imperfect fixation than fully printed out prints, as you will readily perceive on a little reflection. The more perfectly a print is covered with dark objects the more perfectly all the chloride of silver in the paper is reduced, and the less there is for the fixing bath to remove. The more white there is in a print—as in a vignette, for instance—the more unaltered chloride of silver it contains when it is immersed in the fixing bath. Therefore, if the bath be rather weak, or a little exhausted, the vignettes, or prints containing most unaltered chloride of silver, will suffer first and most. Three ounces of hypo to the pint of water will give a somewhat weak bath, which will readily get somewhat inert after fixing a batch of prints. We prefer at least 4 ounces to the pint, and 5 ounces are better, especially where vignettes are concerned.

J. R. L. M.—The trustees, as we explained some time ago, have been acting under legal guidance from the first. The communication to which you refer was a tissue of mis-statements. Subscribers could at any time obtain information from the trustees, as many have done satisfactorily. Non-subscribers have no concern in the matter.

J. G. B.—A vessel for the nitrate bath made of pure silver might, of course, be used, but we cannot recommend it. The baser metal used in soldering would undoubtedly be attacked. Any excess of nitric acid would also act upon the metallic silver. A glass bath in a wooden case is quite safe, with fair usage, for travelling; or, wood lined with pure thin sheet india-rubber may be used.

SOUTH DEVON.—The solution of iodine 1 grain, iodide of potassium 2 grains, in water 1 ounce, is a stock solution, of which, for the clearing process to which you refer, something less than a drachm should be added to an ounce of water. A very dilute solution of iodine will serve to convert the abnormal deposit on shadows into iodide of silver; and this is all that is required. If any portion of the actual image is converted into iodide, it will, of course, be dissolved by hypo or cyanide, and so impoverish the image.

P.—There are several toning baths which keep well and reduce very little; but only one, that we remember, that does not reduce at all. The sulphocyanide bath keeps well and does not reduce at all. Dissolve 1 grain of chloride of gold and from 46 to 60 grains of sulphocyanide of ammonium in 3 ounces of water. This may be used at once, or will keep any length of time. The acetate bath, containing 1 grain of chloride of gold and 30 grains of acetate of soda in from 4 to 8 ounces of water, may be used in a couple of days, or will keep for months; it yields a warm tone, and reduces very little. The lime bath, containing from 1 to 2 grains of chloride of lime and 1 grain of chloride of gold in 4 to 8 ounces of water, is best not used for a week after it is mixed, and will keep for months; it yields a black tone, and reduces less and less as it gets older. 2. To keep a plate moist after development, so as to intensify and fix at leisure, coat the film either with a mixture of equal parts of glycerine and water, or equal parts of golden syrup and water. We prefer the latter. This will keep the film moist many hours; after washing it off, the image can be further intensified, if necessary, or fixed at once. 3. If you will describe the details of your morphine operations, we can probably account for the failure. 4. When

development is tardy with Mr. England's plates, he adds a trace of ammonia to the plain pyro, which rapidly brings out an image.

BETA.—You will find a full description of the "vitrified sheet india-rubber" and its probable applications upwards of a couple of months ago (February 7th). Actual experiment will be necessary to test its practical value. When it is ready for introduction into commerce we shall have more to say about it. We have examined a sample: it is something like goldbeaters'-skin, but a little thicker. It will be sold in sheets; the price we cannot state.

W. J. A. G.—If morphine be used for preserving moist plates, all free nitrate of silver must be first thoroughly washed away. For keeping a plate twenty-four hours, perhaps the glycerine process is best; you will find it fully described on p. 231 of our Volume for 1867. If you describe in detail the operations you employ in the process which gives you so many failures, we can probably point out their origin.

WATERLOO.—You may, without serious results, use the same solutions for plain paper which you employ for albuminized paper, although the solutions for one are not always the best for the other. The dirty yellow of the paper you forward is due to imperfect fixation, and arises, probably, from the use of an exhausted fixing bath; it may possibly arise from keeping the paper sensitive some time before use, or, rather, before fixation; in which case a decomposition has ensued in the combination formed between the silver and the sizing matter of the paper, leaving a dirty, insoluble compound on the body of the paper. This you may see on examining it by transmitted light. Plain salted paper has a right side and a wrong; the right side has the smoothest, finest surface.

J. TAYLOR.—The letter has been addressed and forwarded.

W. CROUCH.—Your negatives having the appearance of positives instead of negatives is due to insufficient exposure and insufficient development. The negative of the print enclosed has either been much out of focus, or you have printed with the wrong side in contact with the paper. 2. You cannot tone after fixing, satisfactorily; but you may, without danger, use sufficient light in toning to examine the progress fairly. A lamp or a candle would do no harm to the toning print, nor would an occasional glance by dull daylight. 3. If the film of the negative stick to the paper, there is little hope of preserving it. It is the result of imperfect varnish, or of using the negative too soon after varnishing. Let us hear further of your progress. You have no need to be discouraged with the results of your first week's practice.

J. MILLER.—The 1B long of the same maker will answer your purpose best. The front lens may be used as a landscape lens. 2 No, to both parts of the question.

J. C. G.—No. 1 is most suitable, and No. 4 least suitable.

L. B.—The print is from an imperfect negative, thin and foggy, apparently; it is too lightly printed, and is over-toned; hence the grey, flat appearance which puzzles you. No amount of toning will give you deep blacks without a sufficient deposit of silver to begin with.

R. D. (Devizes).—Your doublet in preference to your single landscape lens for copying plans. 2. Willis's process is a patented process.

H. P. W.—We are not familiar with the especial lens you describe; but it doubtless requires the same treatment as similar portrait lenses. To use it for landscapes the back lens must be removed altogether, and the front lens reversed, so as to present its concave side to the landscape. The stops being placed in their ordinary places will now be in front of the front lens (which is screwed in the back cell) as nearly as circumstances permit, in the proper place.

B. C.—The effect you describe is fog. It may proceed from a variety of causes; but most likely from the condition of the bath. Try, first, the addition to the bath of a drop or two of nitric acid. If that does not effect a cure, take a 10-grain solution of bicarbonate of soda, and add a few drops at a time until the bath remains turbid; then expose for a few days to the sun; filter, and, after adding a drop or two of acid, try again. The use of a newly-mixed collodion, or of newly-mixed developer, will conduce to fog.

G. R. FITT.—We will examine the precipitate, and report. Thanks for the communication on the Honey Process, which will appear in our next.

"LUX GRAPHICUS on the Wing," and several other articles, are compelled to stand over until next week.

Several Correspondents in our next.

All Communications for the Editor to be addressed to 15, Gough Square, Fleet Street, London, E.C.

* * * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 503.—April 24, 1868.

CONTENTS.

	PAGE
Mr. McLachlan's Discovery	193
Mr. Griggs' Lithographic Process	194
Observations on Mr. McLachlan's Process. By J. Spiller, F.C.S.	195
A Modified Honey Process. By G. Robert Pitt	196
Mr. McLachlan's Discovery. By Nelson K. Cherrill	197
Pictorial Effect in Photography. By H. P. Robinson	198
Remarks upon the Carbon Process. By Dr. H. Vogel	200

	PAGE
Photography Applied to Mechanical Printing Processes. By R. Griggs	199
Proceedings of Societies—Amateur Photographic Association ...	202
Correspondence—"Lux Graphicus" on the Wing	202
Talk in the Studio	203
To Correspondents	203
Photographs Registered	204

MR. McLACHLAN'S DISCOVERY.

ONE essential feature in the mode of working recently propounded by Mr. McLachlan involves specific advantages and disadvantages. The fact that a protracted sunning is necessary to prepare the nitrate bath involves the disadvantage that photographers cannot arrive at a practical decision at once as to the value of the method proposed; but it also involves the advantage of checking hasty conclusions, and rendering necessary patient experiment and time for careful thought before an absolute decision is made. In the meantime it is probable that various questions will be asked, and further explanations will be sought from Mr. McLachlan; and, as is the custom with almost every new method or modification introduced to photographers, the novelty and value of Mr. McLachlan's proposals will be freely challenged and discussed. If this be done in a proper spirit, and for the purpose of eliciting truth, we shall have pleasure in aiding a thorough ventilation of the question. As time and opportunity will be required for testing by experiment the methods described, we shall for the present forbear comment on the subject; but as Mr. McLachlan has kindly undertaken to give such explanations in our pages as may from time to time seem necessary for the elucidation of his improved mode of working, we shall have pleasure in receiving the questions of those interested in the matter.

We shall append here extracts from some letters we have received, asking some questions on the subject; and we may here reply to several querists as to what is the character of Mr. McLachlan's photographs, and how far they bear out his claims to an improved mode of working. We have recently seen a large number of the prints obtained from negatives produced in such a bath as Mr. McLachlan describes, and they undoubtedly possess the highest technical excellence, being exceedingly clean, delicate, and brilliant, and free from defects. One correspondent, signing "Theta," writes as follows:—

"Will you be so good as explain whether Mr. McLachlan insists on absolutely alkaline conditions, or whether he adopts the method described simply to ensure neutrality?"

"If the absolutely alkaline condition is necessary, how does the capacity of the bath to hold oxide of silver in suspension prevent fog, which is often the result of oxide of silver which has been held in solution becoming precipitated all over the plate instead of on those parts only where light has acted?"

"If the neutral condition only is required, is it not a revival of the condition so often insisted upon by the early collodion photographers at a time when iodized collodion only was employed? I believe that many old photographers now hold that a neutral bath made from pure nitrate of silver, and an iodized collodion in good condition, without any bromide, gives the most perfect negatives.

"Is it not a fact that amongst the advantages conferred by the use of bromides in collodion, one of the chief is, that they have rendered unnecessary a degree of purity in all the chemicals difficult to secure and almost impossible to maintain, and that they have permitted the free use of nitric acid as a source of cleanliness without any sacrifice of sensitiveness?"

Another correspondent, "A. Z.," writing on the same part of the subject, says:

"If I understand the statement correctly, Mr. McLachlan works with collodion and nitrate bath as nearly as possible neutral, or just tending towards alkalinity; but I notice there is a compensating element, the influence of which Mr. McLachlan either overlooks or ignores. The developing solution contains an enormous proportion of restraining acid. To 16 ounces of a 12-grain solution $3\frac{1}{2}$ ounces of glacial acetic acid are said to be added; this gives at the rate of more than eight times as much glacial acid as sulphate of iron, nearly half an ounce of the acid to 12 grains of the iron! And this after some pains has been taken to oxidize a portion of the iron, and produce persulphate, which is well-known to act as a restrainer, and promote cleanliness and freedom from fog and abnormal reduction. It strikes me that, without any especial preparation, clean pictures might be obtained with such a developer even when collodion and bath are neutral or slightly alkaline."

R. G. L. says:—"I am anxious to try Mr. McLachlan's process, and as time appears to be an important element, I do not wish to waste time by proceeding incorrectly. Can you tell me where the peculiar quality of nitrate of silver described as most suitable can be obtained? And can you give a sufficiently precise description of it to enable me to distinguish it when I see it?"

"Failing to procure the quality considered best, what is next best? Or, will any ordinary sample of nitrate answer in its degree? Or, can it be treated in any manner which will make it suitable? If not, and the proper kind can only be procured now and then, how shall we secure certainty in working?"

"I notice that Mr. McLachlan is reported as stating that the effect of light on the solution will be considerably limited if it be either acid or alkaline. As many commercial samples of nitrate of silver contain free nitric acid, I presume that a solution made from such nitrate would require neutralizing before sunning. Is this so? It has been customary to require that a silver solution should be made faintly alkaline before sunning, and I have always found this important, as the action of light on an alkaline solution has been more prompt and complete than on one in any degree acid. Is Mr. McLachlan correct in stating that in his operations the action of light is limited if the solution be alkaline?"

"Assuming that I have obtained a good bath on Mr.

McLachlan's principle, how can I tell when the collodion is in proper condition? Shall I have to add any potash solution to a commercial collodion which is already colourless?

"Finally, suppose all done as Mr. McLachlan has described, and satisfactory results obtained, upon what does the stability of the bath depend, or is it due to controllable causes? On this point I cannot find, from the report, that anything very definite has been said at the London meeting, notwithstanding that constancy in the bath and unerring certainty in the results are, as I understand the matter, chief among the claims made for the new system."

We have selected the letters of certain correspondents for extract here, because they contain questions of a representative character, and make known the difficulties of others. We have divested the extracts of other matter, and placed the questions in a categorical form, to enable Mr. McLachlan to deal with them with as little trouble as possible. Categorical answers to these questions will aid materially in making the matter clear. Some of the questions we might have answered ourselves, but we prefer, at present, to leave the matter for fuller explanation in Mr. McLachlan's hands.

In the meantime we may call attention to an interesting article by Mr. Spiller on the subject, in which the reader has the results of two months of experiment by an accomplished chemist. Mr. McLachlan's experiments and conclusions therefrom have been confessedly of an empirical character. As a practical man, he has worked out specific results of which he feels he can speak positively, but of which he does not undertake to explain the rationale. Mr. Spiller gives what he believes to be the rationale of the matter, and attributes the results obtained to the presence of chloride of silver in the nitrate bath. The peculiar quality of the nitrate of silver upon which Mr. McLachlan lays stress Mr. Spiller believes to be due to the presence of chloride of silver; and he is confirmed in this view by the fact that of two baths with which he has experimented during the last two months, made with ordinary nitrate of silver, one was not sensibly affected by light, whilst the other, to which chloride of sodium had been purposely added, gave the reactions which Mr. McLachlan describes.

We have been asked if Mr. McLachlan has divulged the whole of his secret, or whether he retains something for the promised paper next month. So far as we understand the matter, the promised paper will state many details important to be remembered, but that he has stated without reserve the principles upon which he has found success to depend. On this point we shall, however, allow Mr. McLachlan to speak for himself.

MR. GRIGGS' LITHOGRAPHIC PROCESS.

THE process of photo-lithography described and demonstrated by Mr. Griggs at the recent meeting of the Photographic Society has some especial points of difference from all other published methods which are worth noting. We believe that the development of photo-lithography as a branch of industry has hitherto received too little attention in this country, which is behind almost every other part of the world in this especial branch of our art. Although the especial operations of photo-lithography do not come within the scope of practice necessary to the ordinary photographer, yet, in proportion to the growing importance of this branch of the art, it becomes a matter of interest to all photographers to render themselves familiar with the different modes of working, and the respective advantages they present.

The original methods of obtaining a photographic image direct on the stone have, except in a few exceptional cases, been long abandoned for the transfer process first worked out by Mr. Osborne. The modification in Mr. Griggs' process consists in the mode of transfer. The absolute advantage of this modification must be determined by the practical lithographer; but, judging from a *prima facie* examination, it appears to be an unquestionable advantage. In

the ordinary transfer process employed by Mr. Osborne, Col. Sir H. James, and others, the sensitive surface of chromated gelatine, after exposure to light, is covered with transfer ink, and then floated face upwards on a dish of boiling water. The portions of gelatine which, having been protected from light, still remain soluble, are thus softened or dissolved, and are then easily removed by means of a sponge and warm water, with or without the admixture of a little gum and acid. When this operation is completed, the insoluble portions of the gelatine, forming the image coated with the ink, which has adhered to the surface, remain on the paper, all the rest having been washed away, leaving the clean paper only. With a transfer so prepared two difficulties have been experienced. If the coating of gelatine were in any degree too thick, each fine line of the image, standing in high relief, was subject to damage by the pressure used in transferring, and a somewhat blurred effect, from lateral spreading, was sometimes the result. The second risk arises from the danger of the paper containing the image moving in course of the two or three times it passes through the press to secure a perfect transfer of the greasy image to the stone. Mr. Osborne mixes a certain proportion of albumen with his gelatine, which, becoming coagulated by the action of the boiling water, prevents the paper being left quite bare in the whites, and so secures sufficient bite or adhesion to the stone to prevent the paper moving. The plan employed by Mr. Griggs seems to afford a safeguard against both these risks. In his process soluble gelatine is not removed from the transfer. The exposed sensitive paper is soaked for a short time in cold water before the transfer ink is applied; and, after the application, the superfluous ink is removed with a sponge, dipped in dilute nitric acid and gum-water. This removes the ink from the parts where light has not acted, and which are, therefore, still soluble, but leaves the gelatine. The advantages gained are immunity, to a great extent, from the risks we have mentioned. The gelatine causes the transfer paper to adhere to the stone, and so prevents the risk of moving; and it further assists in supporting fine lines, and lessens the risk of spreading and blurring. There are some other modifications in detail, such as the preparation of the transfer paper with starch, for which we refer the readers to Mr. Griggs' paper, our chief object here being to note the difference in principle in the mode of transferring.

We may here mention that we have received a few days ago a very excellent photo-lithographic reproduction of an engraving from Mr. David Duncan, who informs us that he has for some time used the cold method of washing off, leaving the gelatine undisturbed on the paper as described by Mr. Griggs.

It should be noted that the processes to which we are referring are chiefly applicable to the reproduction of images in line or stipple, no recent advance having been made in the rendering of half-tone by means of photo-lithography. Some exceedingly good portraits which have recently been issued as photo-lithographs we are informed, on good authority, do not legitimately come under that designation. They are interesting as excellent illustrations of an application of photography to aid the lithographer, but are not examples of photo-lithography as popularly understood. An enlarged image from a negative is, we understand, printed by a silver process on a finely grained stone, and this image is then carefully worked upon with lithographic chalk by a skilful draughtsman, who accurately reproduces every detail in the photograph. The result is excellent, and the application of our art most legitimate; but it is necessary to distinguish between such a method and the modes of working in which the photographic image is made to give a printing surface without the aid of the draughtsman.

Of the value of the process of photo-lithography, its application at the India Museum is an admirable example, and nothing need exceed the excellence of the photo-

chromo-lithographs produced by Mr. Griggs in illustration of the purpose to which it is applied. Our readers are aware that Dr. Forbes Watson has undertaken the important task of familiarizing the manufacturers of this country with the designs and character of the textile fabrics of India. Photo-lithography lends itself most admirably to this undertaking. Apart from the superior cheapness of photographic delineation to hand-drawing—the cost, Mr. Griggs informs us, is less than half—the accuracy of the facsimile is far superior to anything which could be produced by hand. Every thread of the fabric is rendered by photography; and by the skilful multiplication of the stones all the glowing colours of the Eastern designs are duly rendered. A sight of the examples is more interesting than any description, and we commend all our readers who are members of the Society to fail not in securing the two fine prints placed at the disposal of members, consisting of a gorgeous turban picce, and an exquisite lace shawl patteru, both fine examples of the excellence which generally characterises Indian design.

OBSERVATIONS ON MR. McLACHLAN'S PROCESS

BY JOHN SPILLER, F.C.S.

THE main features of Mr. McLachlan's recent proposal may be said to consist in the neutralization of free acids and uncombined iodine in the collodion by the addition thereto of a minute quantity of aqueous or alcoholic potash, and in the adoption of a new mode of preparing the silver bath.

For making this last-named solution a special quality of nitrate of silver is preferred, which, according to Mr. McLachlan's description, is occasionally to be met with in commerce in the form of moist and somewhat discoloured crystals. Not having had any sample submitted to me I can only conjecture that the special quality here referred to may contain, besides the mother liquor, either a small proportion of metallic silver, reduced by organic matter, or, more probably, of intermixed chloride of silver, blackened by exposure to light. On the latter supposition, which assumes only the existence of a very commonly occurring impurity in the nitric acid used for preparing the silver crystals, I find no difficulty in accounting for the superiority of results obtained by the use of such a salt in the manner described. The instructions given were simply to dissolve the nitrate crystals in an equal weight, or less, of pure water, and submit the concentrated solution to the prolonged action of sunlight, whereby a small quantity of reduced silver is deposited, and "an acid which does not behave like nitric acid" is said to be liberated. After a sufficient exposure neutrality is restored by the careful addition of an excessively dilute solution of pure caustic potash (or soda), added until the oxide of silver thus precipitated redissolves with difficulty. The bath is then iodized and diluted to the strength of 35 grains per ounce in the ordinary manner.

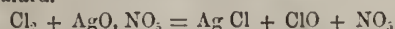
These instructions having been imparted to Mr. P. le Neve Foster and myself early in February last, we had to encounter a practical difficulty in conducting experiments at a season of the year unfavourable to sunlight exposure, and hence the delay in furnishing our report. Nitrate of silver in the proportion to make two 20-ounce baths was, however, dissolved and exposed uninterruptedly for seven weeks (including thirty-five "fair" days) to such light and sunshine as was presented to us. One portion was diluted and tried in Mr. McLachlan's presence, on the 3rd instant, with very good success; three plates being exposed that afternoon, all of which developed "clean," and the sensitiveness was in no way impaired. Mr. McLachlan objected to my using the second bath, on the score of my having added the alkali somewhat incautiously and in too great excess. This solution slowly changed red litmus to blue, but on carefully replacing the acid (dilute nitric) I subsequently produced with it some fair negatives.

Now, with respect to the bath which gave us at once such satisfactory results, I have to explain that it was mixed intentionally with a small proportion of chloride of sodium (1 grain) added to the distilled water in which the nitrate of silver to the amount of 700 grains was dissolved. My object was to ascertain by direct trial the efficacy of the action of nascent chlorine, which I believe constitutes the fundamental and only new feature of Mr. McLachlan's scheme. This suggestion, if supported by the further particulars which that gentleman has promised shortly to give, will then turn out to be a practical realization of M. Balard's chemical reaction, which, eight years ago, I had the honour of confirming in its photographic connection, and of fully describing in a paper "On the Composition of the Photographic Image," inserted in the *Philosophical Magazine*.* When exposing to sunlight finely-divided chloride of silver in presence of an excess of the nitrate, I showed that, whilst nitric acid was liberated, *free hypochlorous acid was generated*. This body is known to be a powerful oxidizing agent; it is, in fact, the active component in bleaching-powder, and its production in an old silver bath giving "foggy" results would be an excellent method of ridding it from many dissolved impurities, and especially those of an organic nature. The same agent would be useful in a new bath as a means of guaranteeing immunity from the admixture of nitrite of silver, which I find to be occasionally present in samples of the fused nitrate. Thus we have, by this combined treatment with nascent chlorine and sunshine, a powerful means of effecting the destruction of a variety of impurities, and its use is certainly worthy of trial in the coming season, besides the recent proposal of Mr. F. Johnson to employ the permanganate of potash, and of Mr. Rejlander's system of *continually* sunning the bath without any chemical addition. A solution of hypochlorite of silver may, if preferred, be separately prepared (by shaking up oxide of silver with chlorine-water) and added to the bath, and the traces of free nitric acid, usually present, may be depended upon for liberating the hypochlorous acid.

In afterwards neutralizing the bath with dilute alkali, according to Mr. McLachlan's directions, of the *two* free acids in solution the nitric would be the first to unite with the alkali, and the proportion of hypochlorous acid outstanding would in ordinary cases be so small that no adverse action in prolonging the exposure need be feared, whilst its presence would act beneficially in restraining the development, and so producing clear pictures.

I conclude by quoting a short extract from my paper of March 1860:—

"The fact of chlorine being evolved during the decomposition by solar agency of chloride of silver under water, has been repeatedly observed and is fully corroborated by my own experiments. It follows, therefore, that if a solution of nitrate of silver be employed in conjunction with the chloride, as in the ordinary practice of photography, the evolved chlorine will exert its own peculiar action on the silver solution in contact, precipitating from it an additional amount of white chloride, which in turn becomes, partially at least, decomposed by light. It has been assumed that *the whole* of the nascent chlorine is thus available for the formation of new chloride of silver; but this can, I think, be true only if other matters are present having the power to decompose hypochlorous acid, a product always formed to the amount of *half* that of the available chlorine, according to the reaction first pointed out by Balard.



"It might then be predicted that by exposing pure white chloride of silver under a solution of the nitrate of known strength, this latter would become continually weakened. This I find to be the case; and in the event of employing a dilute solution every trace of silver is removed, leaving only mixed nitric and hypochlorous acids as residual products

* Vide *Philosophical Magazine* for March, 1860.

dissolved in the water. It is possible also to remove the metal from a solution of nitrate of lead, by exposure to sunlight in contact with recently precipitated chloride of silver."

Woolwich, April 18th.

A MODIFIED HONEY PROCESS.

BY G. ROBERT FITT.

THE season for out-door photography having now commenced, I have thought it not inopportune, seeing the variety of dry and preservative processes which engage, at this period of year, the attention of photographers, to call attention to one of the latter class which seems to have fallen into desuetude.

Knowing, as I do full well, the capabilities of the process, I am anxious to see a more extensive use made of it, as I am convinced that under circumstances where a dark room is accessible twice in (say) twelve to eighteen hours, no method can compare with this in certainty, in sensitiveness, or in beauty of result. I must, at the outset, disclaim any originality or claim to invention, as will be seen further on; anything I can say must have weight only in so far as that I have been, in times past, perhaps more extensively acquainted with the practical working of the method I now, as it were, reintroduce, than any photographer now living, I having employed it exclusively during two photographic seasons—1856 and 1857—for producing a very extensive series of stereoscopic and 11 by 9 views during my residence in Edinburgh.

The process, as many of the older hands amongst us will remember, is one advocated and practised by my late lamented friend, Mr. G. R. Berry, of Liverpool; and when, in 1856, I was elected on the council of the then Liverpool Photographic Society, being much in communication with Mr. Berry, I was led to experiment with it. I found it so valuable that I unhesitatingly adopted it, and perhaps carried it out further even than he did; for his mention of it to me and to our friend, Mr. Thomas, of Liverpool, an enthusiastic amateur, was less as a preservative process than as an acceleration of the ordinary wet collodion process; and this is one of its great recommendations, viz., its extreme sensitiveness, the application of the preservative to the wet plate diminishing the necessary exposure to the extent of one-half or more.

It will be remembered that Mr. Berry was one of the first to recommend the employment of bromides to any extent in collodion, and although I had myself employed them so early as 1854 with great advantage, I had not, as a rule, ventured on more than half to three-fourths of a grain per ounce of collodion. Mr. Berry, at the time (October, 1855) when I had the pleasure of making his acquaintance, was experimenting with far larger proportions, and also, I believe, with collodion containing bromide only—of calcium, if my memory serves me. It was his opinion that the preservative was successful, or perfectly so, only with collodion containing bromide, and my own rather extensive researches into the matter in the two subsequent years tended to confirm his opinion. I remember putting to him the question: "Is it applicable to all collodion?" His reply was: "Not all; it won't do with Thomas's;" Thomas's of that day being, I believe, purely *iodized* collodion. At all events, I can say it *will do* with the beautiful preparation for iron development now sent out by that celebrated maker.

I will now state the method of working. The formula is similar to Mr. Maxwell Lyte's "Instantaneous Process" published many years since. Its essentials are a good and pure sample of honey, which is to be mixed with distilled water, so as to form a thin syrup, and sufficient nitrate of silver dissolved in the liquid to make it contain about 18 or 20 grains to the *Auid* ounce. The mixture is then poured on a small quantity of pure animal charcoal (*i.e.*, from which the earthy phosphates have been removed by digestion with

hydrochloric acid and subsequent *thorough* washing), and then exposed to the sun for a week or more, and filtered, when it will run through paper perfectly bright and clear, and may be kept, for aught I can see to the contrary, for years.

The plate is coated with a good bromo-iodized collodion—not *freshly* iodized—and having been the usual time in the bath, is *well* drained; then from a glass of suitable capacity pour on the syrup, taking care, of course, that it well covers the plate up to the edges; pour off and on three or four times, and then set up to drain on a few thicknesses of religiously clean blotting-paper. Have ready narrow strips of the same paper, and lay one in the bottom of the slide, so that the depending edge of the plate rests on it. In hot, dry weather put a pad of damp blotting-paper at the back of the plate, but smaller than the plate all round, or stains will come if it touch the edge. The exposure I have found to be, as I have said before, extremely short, seldom exceeding three seconds with a Jamini's stereo lens of 6 inches focus and $\frac{2}{3}$ aperture, and with Ross's 10 by 8 single achromatic landscape lens, with which I used to take 11 by 9 pictures from 12 to 20 seconds, using the middle or the smallest stop according to subject (focal length 15 inches). Many times I have secured brilliant cloud effects in this way with every variety of subject; especially, I remember, a negative of Prince's Street with the Scott Monument, a glimpse down St. Andrew's Street, the Firth of Forth, the hills at and beyond Burntisland, and a peak or two of the Ochills in Perthshire, with a fine bank of cumulo-stratus clouds: this was taken from "the Mound" in two seconds. The developer was usually pyrogallie with acetic acid, and sometimes a drop of citro-nitrate of silver (if one may use such a term) in hot weather. Iron developer did not answer except in cool weather, but had we known at that time of the invaluable gelatino-iron, I have no hesitation in saying that would have been the developer *par excellence*, as its special properties could in no process have been shown to such advantage.

With common care in keeping the bath in good order, failures seemed impossible except in using a new supply of collodion; but this, read by the light of our present knowledge, is soon accounted for—the collodion had not had time to ripen. I remember once having a fresh supply from Mr. Barry; trying it—fog! tried again—fog! wrote word that the collodion was bad! went on with my old sample: everything once again right. A fortnight after I was nearly run out, so mixed some new with the old, and I got good results; and by the time the mixture was used up, the new sample was in working order. The same thing has occurred since at intervals of a year or so, until the experience gained at the International Exhibition of 1862 convinced me that no bromo-iodized collodion, even for the ordinary wet process, works at its best until a month or more old.

A slight sketch of my method of working during one year (1856) will show the capabilities of the process. I made about 300 negatives in Edinburgh during the season, and, as the old lady says, "though I say it who shouldn't," I doubt if any series of equal extent has been since taken of better or more uniformly good quality; and I say this only to show what may be achieved by this mode of working.

My "local habitation" was in "St. James' Square," near the head of Leith Walk. I had simply a sitting-room and bed-room, and in the latter all processes appertaining unto negatives were carried on. No more unfavourable place than "Auld Reekie" can well be imagined—for general views, at any rate—and all that could be taken early in the morning I so took. I used to rise at 4 a.m., and, while dressing, prepare six plates, which were carried in as many dark slides. My subjects varied from Portobello to Corstorphine east and west, and from Leith and Granton on the north to Craigmillar and the Pentlands on the south, and everything between these extremes. All my negatives were, from coating to fixing, completed in the said bed-room, much, I am bound to say, to the worthy landlady's an-

noyance, and to the detriment of the wash-stand, towels, &c. However, she survived it, and the next year saw me with a good dark room, which also was the "*locus in quo*" for another series of similar extent.

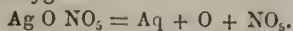
Nothing need, I think, be added to show the feasibility of the process; and when its extreme sensitiveness is taken into consideration, I think if a dark room can be got at within a few hours, it is the plan wheresoever it is important to secure rapidity of working. To him who, alas! is gone from amongst us in the prime of a useful life, and not to me, is due this practical application of Mr. Lyte's process; but having had in my own working so large an experience of its value, both in the years I mention and many times since, I have thought it well to remind your readers of another aid to manipulation which gives with ordinary care results which will in every respect satisfy the most fastidious. I shall be happy to answer any questions as to the matter through the medium of your journal.

MR. McLACHLAN'S DISCOVERY.

BY NELSON K. CHERRILL.

MR. McLACHLAN has fairly taken the photographic public by surprise. His discovery and the manner of its announcement are alike so novel and unprecedented that societies, journalists, and readers all seem quite taken aback; every one, of course, promises to experiment and report progress, but no one seems either fully to understand what has been already advanced, or to care to venture their opinion on the merits or demerits of Mr. McLachlan's proposition. It seems even more difficult for the photographic public to take in the idea of an alkaline bath than that of a bath made with common water in the place of distilled. Of course, when an experiment takes from one to three months to perform properly, according to the inventor's own instructions, no definite answer can be given of its results before the lapse of that time. However this may be, a few words on what has been already advanced may not be out of place. Mr. McLachlan is going to read a further paper on his discovery, and then, no doubt, he will throw more light upon the matter; but as it will be nearly a month before this paper will be in the hands of the public, it may be as well to make a few remarks on what has been already advanced.

In the first place, I do not think it is by any means so certain—at least, Mr. McLachlan has not, it seems to me, set it forth as certain—that he really does recommend the use of an alkaline bath at all. I will explain. It is generally supposed that nitrate of silver is not affected by light; we will let that pass, as it is enough for my purpose that Mr. McLachlan says it *is* affected. Now, the first and most obvious effect of light upon silver salts is to reduce them to the metallic state. All must have noticed how, if the slightest organic impurity gets into the bottle in which nitrate of silver is kept, in course of time the small particles adhering to the sides will become black by decomposition and reduction. Nitrate of silver, when reduced, liberates nitric acid and oxygen—



The reason why nitrate of silver is not supposed to be reduced unless it is in the presence of some organic matter or other suitable substance is, that the equivalent of oxygen will not leave the silver unless some object be presented to it for which it has more affinity than for silver. It seems to me, however, very probable that in performing the McLachlan experiment *some* organic matter may be present, or, if not some organic matter, some trace of an inferior metal in the nitrate of silver, which, I think, would probably answer the same purpose. If, then, such is the case, an exposure to the sun for two or three months would certainly effect a slight reduction of silver, so that the solution which was *neutral when put out in the sun may very probably be slightly acid when brought in again, from nitric acid liberated in the trifling reduction of silver mentioned above.*

Now let us see the result of an addition of a solution of caustic potash. Caustic potash, when added to a neutral solution of nitrate of silver, forms at once a precipitate of oxide of silver, and the solution becomes faintly alkaline, *not* with caustic potassa, because the whole of the potassa is decomposed, but because the oxide of silver is to a slight extent soluble in water, and has, when so dissolved, a faintly-alkaline reaction.

Mr. McLachlan, when his silver comes in again from the two-months' sunning, finds that a trace of caustic potassa added to it does not produce any precipitate of oxide of silver, or that, if produced, that precipitate is at once redissolved. This seems to me to be easily accounted for. The trace of nitric acid I have mentioned as being probably formed in the solution when out in the sun would, of course, at once form, with the oxide of silver, a little more nitrate, and leave the solution either *perfectly neutral or very slightly acid.*

After iodizing, then, Mr. McLachlan dilutes the bath. And here comes a point which requires both more elucidation from the gentleman himself, and also, I think, more careful observation by others as well. We are told that after a certain time all the iodide will be thrown down, and that then it has no more power to dissolve iodide, and no further dilution can precipitate any more. I do not for a moment doubt these statements, but it is not clear yet to my mind quite how the matter comes about, whether the bath is *used* before it throws down the iodide, or whether the action is quite spontaneous and quite independent upon any external circumstances. As we have not yet had this part of the subject fully explained, I would leave it now, as it is more my object to deal at the present moment with the question of the alkalinity than with the keeping properties of the bath.

Should what I have stated prove correct, as to the bath being not alkaline, but having a trace of acid, or being perfectly neutral, it will be seen at once that the result, though gained in a very different way, will be much the same as that obtained by Mr. Thomas in his "normal" bath. He recommends the addition of oxide of silver to the bath—enough to render it turbid; then, after filtration, he adds just enough nitric acid to balance the alkaline reaction. Mr. McLachlan appears to me, on the other hand, to render the solution acid first, and then to balance this acid by a trace of oxide of silver. It may be—and I would be the last to say it is not so—a matter of great importance *how* a result is obtained. Many have, I think, noticed that a bath, especially under some conditions, works better after sunning. Thus it may prove that Mr. McLachlan's *mode* of preparing a bath, albeit the *result* is the same as we have arrived at before, is much the best that has ever been found out.

Now as to the collodion: of course, as Mr. McLachlan says, the collodion must assimilate with the bath, and it seems to me the result which is produced by adding caustic potassa to collodion in a very ripe red condition is merely to eliminate some of the iodine, and reduce the collodion more nearly to the condition of newly mixed collodion, a condition which was some time ago considered as essential to rapid work, especially when the collodion contained rather more iodides than bromides, as, from my experience with Mawson's, I believe is the case with that solution.

Caustic potassa, when mixed with iodine, forms iodide of potassium, &c.; thus it seems to me that the addition suggested to be made to the collodion by Mr. McLachlan simply adds a little to the quantity of iodide of potassium, and eliminates the free iodine. Thus we seem to have a neutral collodion and neutral bath. These conditions would give naturally the "fog" and other mess described by Mr. McLachlan when using a developer made with new good iron, but when old, the iron developer has more restraining power, and is well known to work with more cleanness and certainty, especially under such conditions as I apprehend Mr. McLachlan has recommended.

As I said before, it may be a matter of great importance *how* the result is obtained, and by virtue of going in a new, and I think almost a round-about, way to work, Mr. McLachlan may obtain a result which, though theoretically the same, or almost the same, with what has been done before in a much more simple way, may in some important respects be better.

I may sum up by saying, that though it is difficult to see *how* Mr. McLachlan's plan is better than any other for producing what seems to me a similar result, still, as there is no knowing when we may come to an end of the wonder of photography, it may be a new light has sprung up among us, and I shall have much pleasure in making the whole of the experiments carefully and reporting them when the time comes.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XIII.

"Nature, everywhere, arranges her productions in clusters; and to this end she employs a variety of means. The heavenly bodies are grouped by attraction, flowers and trees by the natural means by which they are propagated, while the social instincts congregate man and most other animals into societies; and the same instincts impel, in man as well as in many of the inferior creatures, the grouping of their habitations. Grouping is, therefore, a universal law of nature; and though there are cases in which a scattered display of objects may, in parts of a composition, greatly aid, by contrast, the more compact portions, and cases in which scattered objects may help to tell the story, yet in the composition of a picture, taking the whole together, a scattered general effect is always a fault."—*C. R. Leslie.*

"We are very sure that the beauty of form, the expression of the passions, the art of composition, even the power of giving a general air of grandeur to a work, is very much under the dominion of rules. These excellences were, heretofore, considered merely as the effects of genius; and justly, if genius is not taken for inspiration, but as the effect of close observation and experience."—*Sir Joshua Reynolds.*

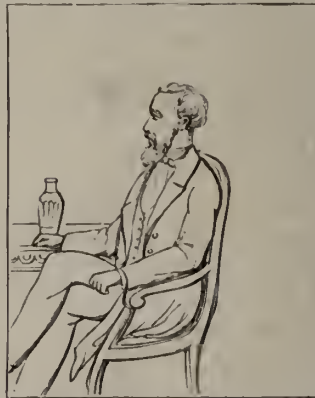
Any very obvious geometrical form, either in masses of light and shade, or bounded by lines, would necessarily be a defect of arrangement; but a certain degree of regularity, such as that arising from a proper appreciation of the rules of composition, and resulting from the concentration and grouping together of the parts, is undoubtedly greatly to be preferred to that kind of irregularity which would be made apparent by the promiscuous scattering of objects over the plane of the picture.

It may be objected that few landscapes will fall into these convenient forms for the benefit of the photographer. This I am quite ready to admit; but when he is acquainted with those forms that are known to produce picturesqueness he will be ready to take advantage of accidents of position and of the various effects produced by light and shade at different times of the day. Besides, forms of objects alter with the point from which they are observed. Twining, who has written a readable if not very practical treatise on the philosophy of painting, says:—"Form itself depends, in a great measure, on the position selected by the observer, on the direction of the lights, and the transparency or mistiness of the atmosphere. From such causes as these the mountains may become more elevated, the plains more vast; depth, space, and distance may be increased; and the artist, who thus adds to the grandeur or beauty of a subject, by availing himself of means borrowed from nature herself, instead of tantalizing the mind, and engendering an admiration based, in a great measure, on ignorance in matters of art, instructs, at the same time he diverts, his admirers." This is equally true for the photographer as for the painter.

But if the landscape will not arrange itself at the photographer's bidding, he has more power and command over his materials when his subject is a figure or a group. If he be not perfect master of the expression of his sitter—and some photographers show by their works that even that is possible—he has in his hands the possibility in a very great degree of governing the disposition of the lines and the

light and shade. If he find several lines running in one direction he has the opportunity of altering the position of the body or the drapery so as to create opposing lines, and he has great scope in the artistic arrangement of the accessories and background in preserving balance, either by lines, or light and shade; and yet how often are these advantages neglected, or, rather, how very seldom are they employed! For many years (and, indeed, to a great extent at the present time) a plain background without gradation was looked upon as very successful work, and nothing but insipid and monotonous smoothness was aimed at by photographers, with the exception of those who already had a feeling for the picturesque, or those who were not too proud to take a lesson from the works of others. It is encouraging to see that many photographers are alive to the necessity of doing something more creditable to the art; and the many imitations that have lately been shown—although few of them have yet risen above the level of mere imitation, or at all approached the great originals—of the productions of that photographic Rembrandt, M. Adam-Salomon, give indication that some improvement may be expected.

It is always well, when possible, to teach by example, and I append an outline of a well known portrait, of which



large quantities have been distributed, chiefly because of the celebrity of the subject, and partly, no doubt, because of the excellence of the technical qualities. I do not indicate this individual picture more distinctly, because I think that when I feel compelled to use any particular photograph as "an awful example," it is scarcely fair to the author to mention his name, although my remarks would be more easily understood if the original could be placed before the student instead of an outline wood-cut.

It will be seen that most of the lines, although not parallel, run in one direction. There is no balance whatever, no variety of lines, no relief, and the space behind the figure is "to let." There is no employment for so much space, except to make the picture the regulation size. The background in the original is perfectly plain—one unbroken tone from the top to the bottom. You see any part of the picture as soon as, or before, you see the head, and the figure appears to be inlaid, or sunk into the background. It would have taken no trouble to alter all this if the operator had possessed a sufficient knowledge of the requirements of art, and, what is quite as necessary when engaged with an eminent sitter, the presence of mind to use it.

This, or a similar position, more full-faced, one hand on a table and the other on the knee, is to be seen in nine out of every ten photographs of the sitting figure; in fact, it appears to be the traditional position of the photographic sitter handed down from the earliest times, and religiously followed by photographers who are not observers, or who do not know how to invent positions for themselves. But, supposing it necessary to maintain the figure in nearly the same position as that in the sketch, what should have been done to produce a more agreeable composition? A very slight change in one of the accessories would have done nearly all

that was required. At present the lines run nearly in the same direction, without any opposing lines to balance them, and there is a space behind the figure that requires filling, while the table and vase carry the eye out of the picture to the left, and overcrowd that side of the composition. If the table had been moved to the right side of the picture, stability would have been given to the figure; the numerous weak and almost similar curves of the figure and chair would have been opposed by the straight lines of the table, the space that was to let would have been filled, the lines of the figure would have been properly balanced, and the table, which crowded the left of the picture, would be doing service to the general effect, and the figure, although turned slightly away from it, would still have the effect of being seated naturally near the table; while, if some attention to light and shade and gradation had been observed in the background, everything would have been brought into harmony. There is another defect which should be carefully avoided: the curves of the chair-back exactly follow the curves of the arm.

As a contrast to the foregoing, I introduce a little sketch by Sir Noel Paton, in which it will be observed that balance



has been strictly considered, and the figure is admirably supported. Notice how the lines of the leaning figure are contrasted by those of the arms, and, for fear these should not be sufficient, two trees have been introduced to perform the same function in the composition. And the hat and plants on the ground perform the part of the point of dark so often mentioned in the chapters on landscape.

This simple little figure illustrates much that is valuable in art, and I shall probably have to refer to it again; at present it has answered the purpose for which it was here inserted, that is, to show the difference between a figure represented "just as it sat," and a picture produced by one who conforms to the rules of art.

PHOTOGRAPHY APPLIED TO MECHANICAL PRINTING PROCESSES.

BY R. GRIGGS.*

IN compliance with a request from our esteemed Secretary, I have the honour to place before you a subject, the importance of which, I think, cannot be overrated; namely, the application of photography to ordinary methods of printing; and I have thought it better to divide the methods of printing into chemical printing, or lithography, and type printing, dealing only with the first this evening, leaving type or surface-printing for another occasion; and in adopting this course I must of necessity be brief, for it is not possible to do full justice to such a subject in one evening meeting like this, because I am desirous, as far as time will allow, of practically illustrating to you the method I have adopted

to obtain these photo-lithographs, in eight colours, which Dr. Forbes Watson, the Chief of the India Museum, has placed in the hands of Dr. Diamond, your Honorary Secretary, for presentation to each member of this Society. A short *resumé* of the various steps which have led us to the useful yet infantile point, we now find photo-lithography, will not be out of place before proceeding to details. The invention of chemical printing, or lithography, was the invention of a German, Alois Senefelder, in the year 1795, who, while in search of a cheap means of printing his dramatic productions, by an accident discovered that, by writing on a piece of Kellheim stone with a greasy ink, a surface could be obtained from which prints could be easily taken, either in one or several colours, and obtaining effects unreached by wood-engraving.

The establishment of the art of lithography in England is due to Hulmandel, who greatly improved the processes for obtaining the different class of drawings from one or several stones, and printing from them in colours. The effect thus obtained advanced the art, and increased the facility for producing artistic effects. I need not enumerate the many workers in this important field, from the time of its introduction into England to that when we find the productions of Owen Jones and Francis Bedford appearing before the public as splendid examples of artistic feeling. As I do not intend these remarks to be anything like an exhaustive essay on this subject, neither do I intend to argue to whom the honour belongs of connecting photography with lithography, as to whether he was an Englishman, a Frenchman, or a German; but I feel bound to say that the name of Osborn should be connected with the wedded life of photo-lithography, not only on account of his early productions, but on the good results he has produced; then the names of Talbot, Poitevin, Ponton, Archer, and Diamond ought to be mentioned, for having provided us with the results of their important discoveries of the application of collodion, potash, gelatine, and pigments, without which photo-lithography would not be in the position we now find it. Although it has had to contend against many selfish elogs, in the disguise of patents, which have been taken out since then to block the path of progress, it has advanced to the splendid position of making the past subservient to the present, by giving us the means of faithfully reproducing, in permanent printing, those interesting manuscripts which give such insight into the manners and customs of those who have preceded us, as well as the beautiful designs which adorn the many public museums and libraries. Our Secretary, since the last meeting, has furnished me with a drawing, from which I have produced a block, which I beg to hand to you for your inspection, and I propose to transfer a copy of the same drawing to stone this evening, and print from it before you, as well as pull a few copies off the stones from which the presentation prints have been taken; and when I tell my commercial friends that these have been produced at less than one-half of the price that these would have cost if entirely done by hand, I feel that I indicate to you a field which is full of promise to the enterprising photographer.

The first important step is to obtain a negative free from deposit on the lines of the subject copied, and moderately dense; it will give the best results if used unvarnished, in consequence of the contact being better than when a film of varnish intervenes between the negative and the prepared paper. The method of preparing the paper is as follows:—Put 1 pound of rice starch into a large bason, and dissolve into a stiff paste, by the aid of a large spatula, using as little cold water as convenient; into a saucepan put half a gallon of water, boil, add half a pound of plaster of Paris, then pour it gently on the paste, which must be kept well stirred till the whole of the water has been added; it should now assume the form of a tremulous jelly; place (say) a dozen sheets of Saxe paper at a time on a board, and with a large brush cover the paper with a thin and even coat of the above. It will be as well to use up the whole of the starch, for the paper may be kept any length of time, and will always be ready

* Read before the London Photographic Society, Tuesday, April 14th.

for the next operation of coating it with gelatine, made by soaking 1 pound of gelatine in cold water the day before you want to use it; throw away the water not absorbed in the gelatine; wash it well; do not be afraid of washing it, for should any dissolve, by all means throw it away, for it would only be a source of trouble if retained. Now add 1 drachm of ammonia, which will carry down the phosphate of lime contained in most gelatine, in consequence chiefly of the admixture of bone with the tissues in its manufacture; dissolve on a water-bath, then add 1 ounce of sugar; strain through warm wet flannel or fine muslin. In coating the paper, various ways may be employed, either by floating it on the warm gelatine contained in a flat dish, or the gelatine may be floated on plate-glass, and then, as soon as it is set, laying damp paper down on it. This would be a good way of coating the paper were it not very slow, for you cannot depend upon getting it ready under two days. I have employed a machine for coating paper which is much too large and clumsy for me to show you here; but, as I intend making a smaller one, suitable for Saxe paper, I shall have pleasure in explaining it on some future occasion. Here is some pigment paper for pigment printing, which process I have completed by camera-printing, doing away with the troublesome transferring necessary in the usual way of carbon-printing. It can be produced by it at a very rapid rate, but for limited lithographic work it is not necessary. The paper prepared as above can be kept in stock like aluminized paper, requiring only to be sensitized by immersion in a saturated solution of bichromate of potash, when it will be ready for printing. With an average intensity of light it will take about five minutes to print, after which it should be immersed in cold water for about a quarter of an hour. Get ready some retransfer ink, rubbed down rather thin with turpentine. Here is the kind of ink I prefer; blot off excess of moisture; then, with a sponge, rub over the print with the transfer ink; then clean the lights of the picture with a sponge moistened with weak nitric acid and gum-water; after which it must be well sponged with clean water. Give the transfer three or four hours' rest, to allow the gelatine to harden in the light. It is then placed on the surface of a clean lithographic stone, either polished or grained, according to the nature of the work; it is then passed through the press. On examining it you will find it adheres very firmly to the stone; the back is now damped with a wet sponge to loosen its hold on the stone; after the paper support is taken away, the picture is gummed in and rolled up with printing ink; it is not yet safe for printing; for although the stone contains gum between the ink-lines of the picture, and theoretically ink will not adhere where there is any gum, yet, in course of printing, the great scraping pressure given to obtain the prints would cause the lines to spread; this is prevented by etching the stone with weak nitric acid, after which it is difficult to get even transfer-ink to adhere, if you wish to make any addition, without scraping the surface acted on by the gum and acid. We have now come to the point where we find this stone, which is the key to all the rest; as many prints are now taken as there are colour stones to be made up on well-rolled paper, the least likely to stretch, then dusted over with powdered red chalk, each laid on a separate stone carefully passed through the press; there will then be a facsimile of the keystone on each of them, which are filled up by hand; where required, several stones can be made by retransferring portions of the keystone. With this subject of eight printings, the keystone is the one used to represent the threads of the material, the set-off of which has only to be filled in solid to make the gold-stone, and so on through the various printings. This is photo-lithography proper, but it is not the only part that photography plays in connection with lithography. Here are some subjects obtained another way. I wish I could have shown you the original drawings from which these were taken, for you to see the truthfulness of their reproduction. When you see these numerous portraits, in some cases numbering over in

each picture, and every one of them an exact facsimile, you will, I think, admit with me that it would not be possible to do it entirely by hand with the same truthfulness, unless it is accompanied by a great expenditure of time and money, bearing in mind that they are all either enlargements or reductions; therefore the ordinary means of using tracing-paper will not do. The way I have adopted is this: I take a reversed negative of the subject; this gives a reverse print; in other words, it is in the exact position required for the stone; it is now used as a tracing. If we place a piece of retransferring paper (made by rubbing red chalk on thin paper) under it on the stone, we have but to go over it with a metal point to obtain the picture in chalk on the stone; it is now ready for the artist to work on with his brush. There is another way of obtaining the picture on the stone; and if I am not greatly mistaken, some prints I have seen lately from "a new process of photography on stone" have been produced by the same means I employed some four years ago by coating a grained stone with silver, and printing with the negative direct on the stone. We have the picture, which requires only to be worked over with the crayon, and thus obtain the fair results which, I dare say, some of you have seen.

Now, gentlemen, I have given you an outline of the way in which the art of photography can and has been linked with a rapid and permanent means of printing, thus diffusing a knowledge of ancient art which would have remained in the dark receptacles necessary for their preservation unknown and unnoticed, except by the book-worm. In collating these few remarks, I make no claim to any new discovery, but must give my humble tribute of thanks to those pioneers of true progress in our art who have not selfishly kept back useful information, or prided themselves on secret dodges, but have come before this and kindred societies, giving freely the results of their labours. I used the word "rapid;" perhaps, when you see the printer at work presently, you will think it is rather slow than rapid; but the application of steam-power to lithographic printing is now making a complete revolution in this method of printing. Here is a specimen which a Conisbee machine has printed off at the rate of 800 per hour, or 8,000 per day; and when I show you the means of retransferring or multiplying any design when required on ordinary-sized paper for bookwork that can be printed in sets of four or eight, you will see at once that a new era is opening for lithography, and, as a matter of course, for photo-lithography. I will now proceed to work, after which, if there is any question any gentleman may wish to ask, it will give me great pleasure to answer it.

REMARKS UPON THE CARBON PROCESS.

BY DR. H. VOGEL.*

SWAN'S carbon process has been the subject of universal attention during the past summer. The paper and chemicals manufactured by that gentleman have been introduced into Germany, as likewise those produced by Rowell, of Boston; and an opportunity has thus, for the first time, been afforded to practical photographers to experiment with the process without the expenditure of very much time and trouble. Many photographers have availed themselves of this opportunity, and from almost every side correspondents have sent us communications, questions, letters, and details of successes and failures. The interest thus evinced on every hand has induced me to make a further investigation of a field already somewhat known to me, and the practical experiences thus gained I now publish, trusting that those operators who may have experienced difficulties in the manipulation of the process may obtain some information from my observations.

Two considerations exist at present against the practical introduction of the carbon process; they are, the high price

* Read before the Berlin Photographic Society.

of the materials employed, and the complicated form of several of the operations. How long these objections will remain in the way time alone will show. The process possesses, however, several important advantages, the greatest of them being the extraordinary sensitiveness of the carbon paper. In summer, during favourable weather, this quality is not so apparent and striking as in the foggy November weather. On a dull November day, when a silver print is scarcely sufficiently printed if exposed from morning till evening, I have been able to obtain an over-exposed carbon print from a negative of average thickness in sixteen minutes and a half, and in nine minutes and a half a remarkably vigorous carbon print from one of Loescher and Petsch's portrait negatives; and this with carbon paper which was by no means of the most sensitive description, but which, under thick negatives, required to be exposed up to 18° of the photometer scale, and with thin plates up to 14°; with paper prepared by myself, I need not expose further than 15° for a thick, and 11° for a thin negative.

This sensitiveness of the carbon paper is a matter of considerable importance in commercial photography, especially when work is carried on on a large scale. If, for instance, the production of a thousand copies were required from one carte-de-visite negative by means of the silver process, the time required for printing the same would be about fifty-six days, or nearly two months; with the carbon process, which is at least eight times as sensitive as the silver method, the thousand pictures might be turned out in the space of seven days.

In the course of last month I made a series of observations with reference to the best method of effecting the transfer of photographs upon glass, suitable not only for the carbon process, but for other methods, such as photo enamelling, &c.

One of the principal points to be attended to, mentioned by Wilson in his article on carbon printing, is to prevent the formation of air-bubbles in the paper during the operation of developing. Freedom from these imperfections may be secured by the very simple precaution of allowing the carbon print fastened to the india-rubber paper to remain for a short time in cold water previous to development. The formation of bubbles results from the presence of air in the pores of the india-rubber paper: if the latter is immersed suddenly in warm water, the air expands quickly, and swells into bubbles under the film of india-rubber; but if the papers are first placed in cold water for a short time (the india-rubber paper uppermost), the air is gradually expelled by the water in minute globules. After remaining thus for a quarter of an hour, the paper may be transferred to a warm water bath, where the picture is detached and developed.

The prior immersion in cold water possesses another advantage: it removes the chromate from the paper, which thus becomes insensitive to light, and allows the development of the picture to take place in the daylight, by which means this important operation may be more successfully controlled.

The developing process I have already described in a former communication. After the picture has been fully developed the paper is rubbed over with a brush, to remove any superfluous carbon particles; and it is then dried, and coated with gelatine. During the last-mentioned operation the formation of minute bubbles often occurs, especially at a cool temperature; but these are easily removed by the application of the finger.

Wilson recommends the transfer of the picture to Steinbach paper, but this operation does not finish the process, as the print must afterwards be mounted upon cardboard. Instead of this, therefore, the picture (as Mr. Swan informs us) may be transferred direct to cardboard, provided the latter presents a perfectly white and even surface. The mode of proceeding is as follows:—The card is placed for the period of one minute in cold water, then pressed between sheets of blotting-paper until it ceases to shine, but appears almost

half dry, and the picture (previously gelatinized and trimmed) laid upon it; both are then placed between pieces of felt and pressed in a rolling-machine, the picture being undermost. Finally, the india-rubber paper is removed with benzol. In operating in this manner it is indispensably necessary that a good cardboard with an even surface should be employed.

Both methods of transfer are, however, open to an objection. The delicate outlines of the picture are easily damaged in the event of the paper being too moist, for the gelatine gives way and the roller injures the softer details of the print. For this reason Cherrill employs a press instead of a roller, and the mode of proceeding detailed by him in a recent article I have found to answer admirably. For small pictures an ordinary copying-press will be found sufficiently powerful, but in this case the pictures must be so wet as to shine. Blotting-paper is laid upon the picture, which is allowed to remain under pressure for about four minutes, and then taken out and dried. By this means it is impossible to damage a picture.

Another interesting idea Mr. Swan has communicated to me: the picture upon the india-rubber paper is immersed completely in a warm gelatine solution of—

Gelatine...	...	...	...	6 to 8 parts
Glycerine	...	...	...	2 to 2½ "
Water	...	...	...	100 "

and when all air-bubbles have disappeared, a piece of fine tracing-paper is likewise immersed in the solution, and both are then removed, care being taken to allow them to draw over the side of the dish, in order that they may be properly drained. Both are hung up to dry, trimmed, placed upon moist cardboard, and put through the rolling-press without any fear of the print being injured by the pressure; the india-rubber is afterwards removed with benzol. This process I have worked with very good success. If the picture upon the india-rubber has been covered with a thick coating of gelatine (with 12 per cent. of gelatine), it can be detached, after moistening with benzol, in the form of a clean film.

This circumstance led me to experiment upon the feasibility of transferring the carbon print to glass—an operation in which I was perfectly successful. For this purpose I coated the picture upon the india-rubber film liberally with the following solution:—

Gelatine	...	...	...	12 parts
Glycerine	...	...	...	4 "
Water	...	...	...	100 "

and fastened it upon a warm glass plate; the transfer was then allowed to dry, and then the india-rubber coating removed with benzol. The picture remained upon the glass plate in the most perfect state. It is as well to coat the picture on the back, before it is dry, with a solution of—

Chrome alum	...	...	...	1 part
Water	...	...	...	300 parts

In the same manner pictures may be transferred to opal glass, and in this form have a very pretty effect. For the enamel and porcelain processes the method is likewise susceptible of application; an enamel colour is mixed as the pigment in the carbon-tissue, and by this means a transferable picture is obtained, capable of being burnt into any suitable surface.

Another interesting circumstance I may here point out. In the picture upon glass we possess obviously a carbon positive, and, by a repetition of the process, a carbon negative may be obtained. Here is therefore a method of multiplying negatives, and of producing them of a more permanent character than by means of the silver process.

Since writing the above, a result of some importance has been obtained in the photographic laboratory at the Royal Industrial College, which will interest those who have experimented with the process. One of my pupils, M. Lothar, a student in the College, was proceeding in the ordinary manner to transfer to Steinbach paper several developed carbon prints upon india-rubber paper; by an oversight, he

omitted to coat the print with gelatine, but pressed the dry india-rubber picture direct upon white paper, treating it with benzol in the ordinary manner after it had become dry. To my astonishment, the picture became detached in the most perfect manner, and I proceeded at once, therefore, to repeat the experiment. A few more carbon prints were prepared and developed, and, when dry, placed upon pieces of moistened white paper, subjected to pressure, again dried, and treated with benzol; this second experiment was likewise remarkably successful. The washing off of the india-rubber was a much easier operation than when gelatine was employed, and the pictures obtained were of a finer and more brilliant description. From these experiments, therefore, and from further trials made in the same direction, it is to be inferred that the treatment of the developed carbon print with gelatine, and the tedious operation of preparing the gelatine solution connected with this branch of manipulation, is a perfectly superfluous proceeding; the considerable amount of time and labour thus gained cannot be estimated too highly. At eleven in the morning the pictures were printed, and at four in the afternoon they were ready for delivery.

I shall be glad to be informed of the experiences of any operator occupied with the process who may feel inclined to repeat my experiments.

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL MEETING of the above Society was held Monday, April 6th, at 12, York Place, Portman Square, the Right Hon. the Earl of Caithness in the chair.

The minutes of the last meeting having been read and confirmed, the following members and subscribers were elected:—Capt. W. Forster; W. Baily, Esq.; P. M. Jackson, Esq.; Mrs. J. Cook; T. Samuels, Esq.; R. Grace, jun., Esq.; R. Leigh, Esq.; E. Milsom, Esq.; M. W. Wemyss, Esq.; E. Horner, Esq.; J. Richardson, Esq. The Secretary then laid before the Council the following prizes, which were fully approved by the meeting:—Five silver goblets, five silver-mounted claret jugs, a coffee-pot, a revolving stereoscope, and seven large photographic albums, whole bound morocco, with silver plates.

The CHAIRMAN then proceeded to sign the certificates of honourable mention, twenty-three in number; after which the Secretary called the attention of the meeting to some specimens of the series of portraits entitled "The British Museum of Portraits," which for the past three years he has been taking under the auspices of the Council of the Association; and after some discussion it was proposed by Mr. GLAISHER, and seconded by the Right Hon. the Viscount RANELAGH, that the Secretary should wait upon Henry Cole, Esq., relative to the transfer of the portraits to the South Kensington Museum. The proceedings then terminated.

A. J. MELNISH, Hon. Sec.

Correspondence.

"LUX GRAPHICUS" ON THE WING.

OXFORD AND CAMBRIDGE—CABINET PORTRAITS—MR. McLACHLAN'S SECRET.

DEAR MR. EDITOR,—Do not let the above heading alarm you. I have no desire to convert the columns of your valuable Journal into a kind of photographic *Bell's Life* or *Sporting Chronicle*. Although the great University boat race has just been decided for the eighth consecutive time in favour of Oxford, it is not of that aquatic struggle that I am going to write, but of another matter in which the Cantabs seem to be behind the Oxonians in the race of life, or the pursuit of novelties. Not only are the Cantabs short in their stroke with the oars, and unable to obtain the first place in the contests on the Thames, they are also slow in giving their orders for a

certain article of commerce which is of very great importance to professional photographers, especially those in the neighbourhood of the University of Cambridge. It is a remarkable fact, that while Oxford has gone in with a rush for those very charming portraits technically named "cabinets," Cambridge holds aloof. How is this, I wonder? There are as good photographers in Cambridge—Mr. Mayland, to wit, whose work is all of the first class—as in Oxford; the sun shines as brightly in the region of the Cam as he does in that of the Isis. Have the Cantabs made up their minds not to be *cabinet* men in opposition to Oxford? or is the fact due to the lukewarmness of the Cambridge photographers themselves? It seems somewhat strange that two places likely to be so similar in tastes and a refined appreciation of the beautiful should so differ in this respect. Are the men of the two great seats of learning in this country opposed in matters of photographic proportion as they are in other matters of minor importance—as in the proper pronunciation of either and neither, for instance? Not having graduated at either, I do not know which is correct, neither do I care; but I am concerned in this question of photography. While at Oxford the cabinet picture has taken deep root, and has grown into a strong and vigorous article of demand, it is a well-known fact that at Cambridge it is "sicklied o'er with the pale cast of thought," and languishes on in a state trembling between life and death. Whether the producers or consumers are to blame for this languor in the demand for an article that is certainly worth being cultivated, is more than I can say. I know that the discrepancy exists, and the rest I leave to those most immediately interested. It cannot, however, be supposed that a demand for any particular size or style can spring up spontaneously; that must be created by the producer, by popularizing the style in some attractive and judicious manner, and the cabinet size is well deserving of a very strenuous effort being made in its favour.

Of all the photographic sizes that have been introduced to the public the cabinet is the most artistic in its proportions. As nearly as possible it falls under that art rule of producing an oblong or parallelogram of the most agreeable proportions, which is as the diagonal is to the square. The size of the cabinet is 5½ by 4, and if you measure the diagonal of the square of 4 inches, you will find that the length of the cabinet, 5½ inches, is as near that as possible. Doubtless Mr. Window had this in view when he introduced the size, and, whether for upright or horizontal pictures, such proportions are decidedly the best. Many of the sizes already in use are too long, others are too short and square. In addition to the beautiful proportions of the cabinet size, it gives the portrait photographer more room and opportunities to introduce harmonious forms and effects in the posing and arrangements of portraits and groups; and I have seen some very charming views on the cabinet size, 5½ by 4 inches, horizontally; as well as some very beautiful interiors of Westminster Abbey, by Mr. V. Blanchard, on the cabinet cards vertical, which proves pretty conclusively that the proportions of the diagonal to the square of any size will suit both vertical and horizontal pictures. I have not the least doubt but a much greater demand for those cabinet pictures, both portrait and landscape, could be created, if photographers would set about introducing them with a will; depend upon it if they will but put their heart into the matter, they would put money into their pockets. I know how much has been done by launching them fearlessly on the sea of public patronage in several localities, and I feel certain the demand would be much more general if the cabinet picture were judiciously introduced. Mr. H. P. Robinson and Mr. Nelson K. Cherrill, having entered into partnership, are on the point of opening a photographic establishment at Tunbridge Wells, where they intend to incur considerable expense to introduce the cabinet portrait, and give it that prominence it so justly merits.

Since writing you last, I learn from a friend who is intimate with Mr. McLachlan that there is every possibility of his secret being revealed ere long. That this secret formula will be an immense boon to all photographers, there can be little doubt.* If an absolute immunity from streaks in the direction of the dip, brain-markings, and pinholes—which are the advantages said to be derived from the process—can be guaranteed, then will the manipulatory part of photography be at once made easy; and Mr. McLachlan will have conferred a personal obligation on every photographic manipulator. Not only will photo-

* This letter was received before the meeting of the Photographic Society.—Ed.

graphers be benefitted by Mr. McLachlan's generous conduct, the whole world will participate in the advantages he intends to place as a gift in the hands of photographers; and even art, that is so afraid of a photographic amalgamation, will be honoured by the revelation. But once let the mind of the operator be for ever free from the cares and anxieties of his negative being clean, spotless, and excellent in quality, he will then have more time and inclination to put his art knowledge, if he have any, into practice, by paying more attention to the pose of his sitters and the artistic choice and arrangement of accessories. If he be without art-knowledge he will be obliged to acquire it and put it into practice, or be driven out of his field of operations. For, if the chemical difficulties and uncertainties are to be so summarily disposed of, and all the manipulations reduced to a certainty and dead level, a pre-eminence in the profession can only be maintained by him who exhibits a taste, feeling, and love for his labours superior to the desire to palm upon the public, for mere gain, works that are a disgrace and a scandal to the profession of which he is a member. That such a condition of things photographic may be quickly brought about is much to be desired, and if such be the result of Mr. McLachlan's very noble willingness to give to the photographic community experiences that have cost him much time and money in acquiring by close observation and experiment, he will, at the least, be entitled to the sincere and hearty acknowledgments of all well-wishers and lovers of our art-science.

Apropos of clean and easy development, I should like to know if any of your numerous readers have tried the effect of sulphate of zinc with the iron developer. I understand its use obviates the necessity of using acetic acid as a retardant; that the deposit of silver is much more delicate than that produced by iron alone; that the control over it is very great; that any amount of intensity can be obtained by one or more applications, without the aid of pyrogallie acid, and without producing harshness or hardness. With such recommendations it is certainly worth a trial. I have had no time to try it myself, but think it is of sufficient importance to give your readers an opportunity of experimenting with it, and judging for themselves.—Yours very truly,

LUX GRAPHICUS.

April, 10th, 1868.

Talk in the Studio.

PORTRAITS WITH NATURAL BACKGROUNDS.—Since our notice of the charming artistic portraits of Mr. Edge, in which a pictorial background obtained from natural scenery was introduced, we have seen several praiseworthy attempts in a similar direction. A short time ago Mr. Burgess, of Norwich, sent us an example in which the natural background from a second negative was most successfully introduced. We have just received a packet of portraits "produced in the ordinary course of business" by Messrs. Robinson and Thompson, of Liverpool, in which this method of working is carried out with great success, and is manifestly, from the wonderful variety of effects, worked on a tolerably extensive scale. We have upwards of a dozen portraits, in every one of which a different scene is introduced for the background. Many of these are charming portraits of nice children, whose costume and occupation harmonize admirably with the scenes. Here is a bright intelligent little fellow trudging through the furze with his gun; and next we have him with the piece rested upon a large boulder, sighting his game. In another the same little urchin is stretched upon the grass overlooking a stream. In others a pretty little girl with a basket full of wild flowers rambles or rests among pleasant scenery. In all cases the varied landscapes join admirably with the foregrounds, generally composing well, and retiring sufficiently to give atmosphere without fog. We understand that many of these examples excited much interest at the recent soiree of the Liverpool Society. We are glad to see the brother of Mr. H. P. Robinson following his example, and excelling in combination printing and art photography.

LONG EXPOSURES IN LANDSCAPE PHOTOGRAPHY.—A correspondent signing "Gladiator" sends us a long letter on this subject. After some trenchant remarks on a communication which has appeared in other pages, and to which it is not

necessary to refer further here, he says:—"As to the question of 'truth to nature,' I confidently assert that, as a rule, long exposure gives a false representation of nature, the reasons being simple and obvious. A landscape is taken under certain conditions of light: if a long exposure be given, those conditions will be materially altered; in sunshine the change would be rapid, the shadow from each object changing with the course of the sun, so that what is light one minute becomes shadow next. An exposure of 90 minutes would simply produce a muddle of light and shade, truth to nature being sacrificed. On other grounds the system of capping the lens during exposure should be repudiated, the play of foliage in the wind being as much a part of nature as the immobility of the trunk."

COLOURLESS VARNISH WITH COPAL.—To prepare this varnish the copal must be picked; each piece is broken, and a drop of rosemary oil poured on it. Those pieces which, on contact with the oil, become soft, are the ones used. The pieces being selected, they are ground and passed through a sieve, being reduced to a fine powder. It is then placed in a glass, and a corresponding volume of rosemary oil poured over it; the mixture is then stirred for a few minutes until it is transformed into a thick liquor. It is then left to rest for two hours, when a few drops of rectified alcohol are added and intimately mixed. Repeat the operation until the varnish is of a sufficient consistency; leave to rest for a few days, and decant the clear. This varnish can be applied to wood and metals.—*Journ. Applied Chem.*

INFLUENCE OF COLOURED LIGHT ON PLANTS.—Recent experiments by L. Cailletet confirm those made many years ago by Morren, of France, with regard to the influence of the luminous rays in vegetable growth. The former advances a step further by including the red, as well as the yellow ray, among those most favourable in promoting the decomposition of carbonic acid gas by plants. All the rays more refrangible than the yellow are powerless in this respect. Under the influence of green light, not only does no decomposition take place, but new qualities of carbonic acid are formed, the exhalation of the gas by the fresh leaf being nearly as much under this condition as when placed in the dark. Light passed through a solution of iodine in bisulphide of carbon prevents decomposition of the acid, and, says the *New York Tribune*, the appropriation of carbon by the plant, but does not seem to increase the quantity of acid, which might be inferred from the fact that the violet is the most refrangible of the coloured rays. Many experiments have been made in this country which give the same general results of those of Morren and of Dr. Daubeny, of England, but differ somewhat from those of Cailletet.

To Correspondents.

A. P. A.—The iodizing solution of the collodion you mention contains a bromide as well as an iodide. 2. The *Photographic News* is published every Friday morning at 9 o'clock, and the delay in obtaining it must be due to your agent, who ought to explain to you. 3. We believe the next collodion you mention contains a bromide, but we are not certain. 4. You may, for special purposes—such as preparing dry plates—add an extra proportion of bromide with advantage; bromide of cadmium, being most soluble, is most suitable to your purpose.

J. C. D.—The yellow sample of paper will probably answer pretty well for covering a background screen. You will best ascertain by pinning a piece to a background and photographing it. It may possibly turn out too light. We prefer blinds to skylights to run on rods fixed at ridge and eaves. We are glad to hear that you like Mr. Robinson's Art Lessons.

YOUNG.—You are in error in fancying that a picture could be obtained by any reasonable exposure on ordinary excited albuminized paper in the manner you describe. You fail simply because the light is insufficient and the surface not sufficiently sensitive for producing a picture. An enlarged image, obtained by the light of the north sky, is not nearly sufficiently brilliant to print on albuminized paper. You might possibly manage it on iodized paper and development; but then the exposure would be very protracted. There is no process more sensitive than the development printing process on bromo-iodized paper. You could produce an enlarged negative by the method you tried, and print from that on albuminized paper. 2. The solution for silvering brass to which you refer as sold in the street was probably a preparation of mercury. The red powder at the bottom was probably iodide of mercury.

- Such a method of "silvering" is useless for ordinary purposes.
3. Yes: it may be used for landscape either as a portrait lens, stopped down, or the front lens may be used alone, and, being of longer focus than the combination, it will cover a larger plate.
4. The landscape you enclose would have been better if the masses in the left-hand corner had been balanced by some object in the right.
- J. B. CARTLIDGE.—Acetate of morphine is a salt, generally in a white amorphous powder, and can be obtained of most chemists. Permanganate of potash is a salt, consisting of purple crystals. You can obtain either of most dealers; certainly of Mr. Thomas, Mr. Rouch, or other photographic chemists. The recipes to which you refer are valuable in rendering glass non-actinic; and the varnish you mention also answers well. We should think that it might be used to the glass of a lamp to make the light non-actinic.
- P.—The source of failure is in the mode of developing. Before adding the iron solution add to it a drop or two of nitrate of silver solution. You will find in our last Volume several articles in which, amongst the causes of failure discussed, this one is especially pointed out. Try again, and let us know the result.
- F. M. YOUNG.—Collodio-bromide of silver plates may be used in the wet state; but they must receive the tannin coating, and must be developed with pyrogallie acid, not iron; in fact, developed as Mr. Mawdsley directs in our last YEAR-BOOK for dry plates. 2. Dissolve the silver in the alcohol before making the collodion, and, when required, add the alcoholic solution of bromide; or add sufficient of a saturated solution of nitrate of silver in distilled water to plain collodion, and then add alcoholic solution of bromide. 3. The silver bath does not require modifying when sulphocyanide toning is used. The bath with either nitrate of soda or sugar may be used as well with the sulphocyanide and gold toning bath as any other toning bath. The bath is generally neutral; if not, it may be made so with chalk. 4. The time varies with the proportion of gold present: from five minutes to half an hour, according to depth required and other circumstances. 5. The negatives we intensified with permanganate were developed with protosulphate of iron and acetic acid solution. We have not tried it with a gelatino-iron developed negative, but in no instance did we fail to get the orange tint. Let us know your further results. 6. Coffee plates can be developed with iron, but not so well as with pyrogallie acid.
- H. S.—We are glad to learn the successful issue of your experiments. We shall be glad to see an example of the insoluble deposit.
- D. J. W.—We regret that we cannot give you any definite information as to the probability of your getting an engagement in a first-rate London studio for the purpose of getting an insight into the mode of working. As a rule, photographers in good practice do not care to employ assistants on such terms; but it is probable that you would best serve your purpose by inserting an intimation of your desire in our advertising columns. You can call upon us if you wish for more direct information.
- J. B.—You will find details of the Eburneum process in our YEAR-BOOK for 1866, stated by the originator, Mr. J. Burgess, of Norwich.
- R. L. M.—The old red insensitive collodion of which you speak cannot be made useful for producing negatives, especially as you remark that the film is perfectly rotten.
- HUGO.—The new chloride of silver voltaic battery of Messrs De la Rue and Muller is remarkable for the intensity of the current which may be obtained from it, but it would not compete with Grove's battery for the economical production of the electric light. Forty cells were used to exhibit its powers at the Chemical Society's Soiree. The novelty consists in the generation of a comparatively powerful electric current in a battery of which the cells are charged with a *single liquid*. Salt brine, which soon becomes partly converted into chloride of zinc, is employed as the exciting fluid. The new battery, elegantly mounted on a mahogany stand and in series of ten cells, can be procured from Mr. William Ladd, Beak Street, Regent Street. You do not state how the toning bath was made which has become inert, so that we cannot speak with certainty as to the remedy. Try adding a few drops of a fresh concentrated solution of chloride of gold to it.
- LOST IN LONDON.—We have used a sulphocyanide toning bath immediately it was mixed, and months afterwards, with success; but, on the whole, prefer it fresh mixed. Increasing the proportion of sulphocyanide reduces the tendency to a pink tint in the lights. The addition of a little chloride of sodium to the bath also decreases the tendency. We do not dislike the rosy tint of the print sent. 2. More front light would not have been an improvement.
- J. A. R.—You do not state the nature of the difficulty in getting good tones. Do the prints tone too rapidly and become too blue? If so, make the bath still more dilute. The hypo and gold bath is made by adding about 4 grains of chloride of gold (first dissolved) to a pint of fresh fixing solution. The coffee plates are stated to require ordinarily three or four times as much exposure as wet

plates; but it is quite possible that under some circumstances ten times would not be too much. We will make enquiry into the error with which we regret to learn you have been troubled.

W. J. A. G.—It is quite imperative that you use both eyes in looking through a stereoscope, as you cannot get the effect of binocular vision with one eye. A limited effect of solidity may be obtained by examining a good photograph with a lens; but the proper effect of relief and distance can only be obtained by using both eyes. The two halves of a stereoscopic slide are dissimilar views of the same subject, such as would be seen by the right and left eye respectively, and these must be combined in the stereoscope as they are in natural vision in order to produce the true binocular effect of relief and distance. It is a common error with persons who have not familiarised themselves with the use of the stereoscope to fancy they can see better by closing one eye. You cannot judge correctly of distance in nature by the use of one eye only, as you may easily prove. There is only one reason why a stereoscopic slide must be examined by both eyes, and that we have just stated; namely, that the two pictures, being views of the same thing from two different points of view, can only be seen as one picture by two eyes. Two views exactly identical would be useless. 2. A perfectly fixed and properly washed print will not be injured by using warm water to remove it from its mount. Hot water as final bath in washing prints is a good thing.

CONSTANT SUBSCRIBER.—The process would require too much space to describe here. You will find it described in our last YEAR-BOOK, in the article on "A Simple Method of Enlargement." We shall probably have something to say on the subject shortly.

REV. J. H. JOHNSON.—India-rubber solution may be used safely without fear of injuring the bath. It may be used as preliminary coating to the whole plate, or only to the edges, as you may choose.

G. R. FITT.—On examination of the precipitate, it appears to be acetate of silver with a little reduced metallic silver, and a slight trace of chloride of silver, cyanide of silver. The peculiar lustre is characteristic of acetate of silver.

R. B. (India).—The dirty yellow or brown mottled markings and spots are due to imperfect fixation. Either from weakness, impurity, or exhaustion of the hypo bath, or from imperfect immersion, the prints are not perfectly fixed, and insoluble hyposulphite of silver, being formed in the paper, decomposes in the washing water, causing the dirty brown mottling in question. The prints sticking together and not being kept in motion will cause a few prints in a batch to suffer when others are all right. The remedy is plenty of fresh strong hypo, and care to see that the prints get all thoroughly immersed and brought under the action of the fixing agent. Thanks for the print.

* * * Owing to the unusual pressure on our space, many articles are compelled to stand over until our next.

Several Correspondents in our next.

Photographs Registered.

- Mr. M. BOAK, Great Driffield,
Photograph of the late Mr. J. Searo.
- Messrs. W. and D. DOWSEY, Newcastle-on-Tyne,
Photograph of Mr. S. Phelps.
Photograph of Mr. E. Phelps.
- Mr. E. STEELE, Wisbech,
Photograph of Water-Colour Drawing, &c.
- Mr. R. A. REEKS, Evesham,
Photograph of Duc d'Aumale's Harriers, &c.
Photograph of Duc d'Aumale's Huntsman.
Photograph of Mr. H. H. Stephenson.
- Mr. J. EASTHAM, Manchester,
Seven Photographs of Proposed New Town Hall, Manchester.
- Mr. H. RONIX, Landport,
Photograph of Triumphal Arch at Landport.
- Mr. C. SANDERSON, Preston,
Three Photographs of Mr. Guttridge, Wesleyan Minister.
- Mr. G. BECK, Sheffield,
Photograph of Edward Byron Pagdin.
- Mr. BRIGGS, Leamington,
Five Photographs of Lord Leigh.

All Communications for the Editor to be addressed to 15, Gough Square, Fleet Street, London, E.C.

* * * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

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CONTENTS.

	PAGE
Vitrified India-Rubber Sheet	205
Photography and the Abyssinian Expedition	206
Panoramic Stereoscope	206
Photographic Piracy of Engravings	207
Echoes of the Month. By an Old Photographer	207
Photography at the Royal Cornwall Polytechnic Society	209
On Natural Clouds and Atmospheric Effects in Landscape Photography. By Nelson K. Cherrill	209

	PAGE
Estimating Exposures. By Robert Gillo	209
Pictorial Effect in Photography. By H. P. Robinson	210
Convention of Photography in the United States	212
Recent Patents	212
Correspondence — Sel Clement—Mr. McLachlan's Discovery— Insensitve Spots in Morphine Plates	213
Talk in the Studio	215
To Correspondents	215

VITRIFIED INDIA-RUBBER SHEET.

ABOUT three months ago we called attention to a new material, which had been introduced in Paris by M. A. Marion under the above name, possessing valuable qualities for many photographic purposes. We have just received from Messrs. Marion and Co., of Soho Square, some sheets of the new material for experiment, and a brief description will doubtless interest our readers.

The "caoutchouc pellicle" is in sheets the size of photographic paper, about 22 by 18 inches. It is thin, colourless, transparent, exceedingly pliant, possesses a fine surface, and is waterproof, or nearly so, not being affected by fluids until after long treatment, and then only slightly. It is exceedingly tough, bearing considerable strain without tearing, and is slightly elastic, stretching a little when pulled.

The multiplicity of purposes to which a material having most of the properties of glass without its fragility, and which might be called flexible glass, may be applied in photography will occur to most readers. At present, however, but few of its special uses have been pointed out. M. Marion proposes it as a means of transferring negatives from glass, and forming a convenient support, free from risk of breakage, permitting the negative to be used with either side in contact with the sensitive paper, without loss of sharpness, and rendering the storage of the negative an easy thing. He treats the negative film with a suitable varnish, applies the transparent pellicle, and, when all is perfectly dry, immerses the plate in water, by which the collodion film is detached from the glass, and is removed, adhering to its new support. He also proposes it for use in carbon printing, as rendering unnecessary one of the transferring processes usually necessary. The sensitive pigmented gelatine, being applied to the new material, might be printed through it, and then developed without mounting previously. The print might be finally mounted with the vitrified sheet uppermost as a protection, or steps may be taken after mounting to remove it.

We foresee some slight difficulties in the application for carbon printing, which, however, may probably be overcome in practice. If the vitrified sheet be left in contact with the carbon image it will interfere somewhat with the artistic character of the result, as a glazed surface in the lights generally lacks the feeling of purity and repose which belongs to a matt surface in the lights of a paper picture. To secure the best surface, therefore, it would be necessary to remove the caoutchouc pellicle after the final mounting, and at present we are not sure that this could be done successfully. The material, however, is one of which carbon experimentalists will be glad to make trial. We hope shortly to be able to record some results in this direction.

At present we have only had opportunity for experiment in two directions with the sheets sent to us. We have employed it as a protective surface to small pictures, in a manner similar to that in which sheets of collodion and gelatine have been used, and also as a substitute for glass in taking negatives. For the first purpose its application is simple and easy. A sheet of the material, having been cut to the required size, is immersed for a few minutes in clean water, or dilute alcohol and water would be better still. The picture to be protected is then wetted, either by holding under a tap, or immersing in a dish of water. The wet, vitreous sheet is then brought into contact with the wet surface of the print, which till then is kept in a horizontal position: the two being then raised into a vertical position, and drained, the surfaces come into close contact, the water running out from between them driving away all air-bubbles. A sheet of paper is placed over the surface, and the whole rubbed well down to secure firm contact. The protected print is then dried under pressure. The appearance of the finished print is very similar to that of a print "enamelled" with gelatine and collodion.

In our attempts to use the vitrified sheet as a support in producing negatives, we proceeded as follows:—A piece of the sheet is cut about a quarter of an inch less than a plate of glass of any suitable size. The vitrified sheet is moistened at the back, and placed on the plate of glass, to which the moisture causes it readily to adhere. It is then coated with collodion, which, flowing over the edge of the sheet and up to the edge of the glass, protects it from displacement in the nitrate bath. This done, the manipulations are conducted in the usual way until the negative is finished, when it is easily removed from the glass by running a penknife round the edge and lifting away the negative on its limp transparent support. There are certain precautions necessary in these manipulations: it is important to see that the pellicle is quite flat on the glass without wrinkles, and that the edges do not curl up so as to permit the collodion to flow under between the vitrified sheet and the glass. The inconvenience and imperfection which would arise if care were not taken in this respect will be readily understood.

The most curious difficulty we met in using the new material as a substitute for glass in taking negatives is one which we hope is exceptional, or in any case we are disposed to believe it is avoidable. It is this: the exposure required is much longer. In our first experiments we were puzzled to find each negative considerably under-exposed, and concluded that the chemicals were out of order. In the course of further experiment, however, in using a piece of the vitrified sheet much smaller than the glass on which it was manipulated, we found that the excited film on the bare glass was over-exposed, whilst the same excited film where it rested on the new material was thin and under-exposed. This fact was verified by

further experiment. Its cause remains to be ascertained, and possibly removed. Another detail may be mentioned. After passing through the various manipulations, and being subjected to the action of the various solutions in taking a negative, the pellicle acquires a somewhat opalescent appearance in place of its former perfect transparency. This effect continues on spontaneous drying, but disappears on the application of heat.

We may here mention an ingenious application which Mr. Woodbury has for some time contemplated making of such a material as this. He proposes to sensitize a long strip of it by some trustworthy dry process; and, providing a camera with a couple of rollers, wind off from the supply roller sufficient for a negative. After exposure this would be wound on to the other roller, and a fresh supply at the same moment brought opposite the lens for further use. The compactness and convenience of such an arrangement will be readily understood. The working out of such an arrangement is a matter of detail which we need not discuss here.

The exact nature of the material and its mode of preparation are, of course, M. Marion's secret; but as photographers rarely like to work with materials of the constitution of which they know nothing, we may state at once that there is very little doubt that the basis of this fabric is collodion; and although it is named vitrified india-rubber, it is very doubtful whether india-rubber enters at all into its composition. The strong and peculiarly characteristic smell of castor oil is one of the first characteristics which came under our attention in examining the pellicle. On treating it with benzole it remains unaltered. It is at once penetrated by ether, and softened, but, like collodion films under such circumstances, not readily dissolved. It burns in the rapid explosive manner of pyroxyline, leaving a little sticky residue like burnt oil. Dr. Vogel described in our pages about year and a half ago the "leather collodion" of Herr Grune, made from plain collodion containing four per cent. of soluble cotton and three per cent. of castor oil, and this appears to be a substance of a similar constitution. Dr. Vogel proposed to supplement a film of the leather collodion with a layer of india-rubber in certain cases, and he describes the films so prepared as very solid and a little elastic. The object for which the preparation was then proposed was the transfer of negatives. It appears probable that to M. Marion has occurred the happy thought of expanding this idea, and forming a transparent fabric in sheets ready for use, which will have a variety of valuable applications. Whatever the precise nature of material employed, the skill with which it is prepared, and the beautifully transparent, tough, and flexible pellicle produced, confer a boon on photographers generally.

PHOTOGRAPHY AND THE ABYSSINIAN EXPEDITION.

We are in receipt of intelligence concerning the staff of photographers attached to our army in Abyssinia. From a private letter, which left that country on the 20th March last, and has been considerably delayed in transmission, we learn that Sergeant Harrold, Royal Engineers, the chief photographer, has been remarkably successful in the fulfilment of his very laborious and difficult duties. His labours commenced at Annesley Bay, where a large panoramic view, on three negatives, was taken of the pier, shipping, store-houses, &c. As soon as this had been completed, he was at once ordered up the country to Senafe, views of the mountain passes being obtained *en route*; and here he remained with his staff for a short time, taking extensive photographic sketches of the camp and environs. From Senafe he moved forward with the first brigade of the army, accompanying General Merewether on some of his exploring expeditions, and obtaining views of the country which considerably facilitated the construction of maps and plans required for the Quarter-Master General's Department. Sergeant Harrold

speaks in high terms of the equipment with which he was supplied, and especially of the packing thereof. In enumerating the many difficulties with which he has had to contend, and more especially with regard to the carriage of the apparatus, he says:—"Two of our mules had a regular dance round the camp one day, with a couple of our boxes dragging behind them. One of them rolled over on his back three times whilst carrying two of our plate-boxes, and afterwards fell down a place called the Devil's Staircase. I am surprised the equipment has stood so well as it has, and I think Mr. Meagher deserves great credit for the substantial manner in which he fitted it up, for it has been exposed to all weathers, merely covered with some tarpaulins."

As regards operating, Sergeant Harrold tells us he has been very much troubled with the dust blowing into the dark tent, and, inasmuch as the country is in some parts exceedingly dry, and no rain has fallen for three or four years, the amount of dust everywhere is very considerable. The water has been very good throughout, but at times it was remarkably scarce. The collodion he took out with him perfectly fulfilled his expectations. He says:—"I am surprised the collodion stands the test of the campaign so well; I must say that both Thomas's and Ronch's work first-class, and give me no trouble whatever."

All the stores and chemicals have been found to work well, and, with the exception of some of them running rather short, there is nothing whatever to complain about. It is the difficulty of transporting the apparatus and fragile paraphernalia over bad roads and paths of the rudest description which constitutes the chief obstacle to be overcome, not to mention the unpleasantness of being obliged to find one's way from one out-of-the-way place to another, unaccompanied by a guide, and unprovided with an escort. At no time, however, was it necessary to leave the dark tent and baths behind, and there was no occasion, therefore, to employ the dry plates with which Sergeant Harrold had provided himself in case of emergencies.

Besides the reproduction of landscape views, the chief photographer had likewise to exercise his functions pretty frequently in taking portraits. Groups of the different native chiefs surrounded by their suites, of the Prince of Tigre, of Kassai, and many other dusky warriors, had to be taken; and when, as in some instances, these gentlemen refused to be operated upon except under the shelter of a dark bell tent, the task of producing a picture with the sun shining full into the camera was by no means an easy one.

Other interesting subjects for the camera were not wanting, as shown in the following:—

"I have had an opportunity of obtaining a few photographs of an Abyssinian bible, which I believe is about four hundred years old; it is rather an odd-looking book, the leaves being of parchment of a dirty yellow colour. My copies, however, give a very good idea of the original, and show well the rude sort of paintings contained in the book. I copied two portions of the Gospel of St. Mark, and likewise a cross belonging to a convent at Goona Goona. I was left behind with four men to complete some prints and to copy these articles, and found myself, when I had done, eighteen miles from the main body, in an unknown district, without a guide. We went a considerable distance out of our way before we again fell in with our troops, and then found out that we had marched in the wrong direction and had arrived at the wrong camp."

Sergeant Harrold certainly appears to be the right man in the right place, as combining within himself the qualities of a skilful photographer and the power of readily accommodating himself to any circumstances.

PANORAMIC STEREOSCOPE.

We have had brought under our notice a new form of stereoscopic picture and stereoscope, projected by Mr. W. H. Warner and Mr. Robert Murray, which, for a large class

of subjects, possess decided advantages over the ordinary form familiar to the public. A common aim amongst photographers for years past has been to secure a larger horizontal angle in their pictures; panoramic lenses, panoramic cameras, and wide angle lenses of various kinds have been introduced to secure this result, and with various degrees of success. From the name given to the new form of instrument we are describing the reader will probably come to the conclusion that its aim is to render in the stereoscope the panoramic effects, or greatly extended horizontal angle, to which we have referred. Such is not the case, however; the aim is rather to present a view in which the vertical angle included is twice the horizontal angle. The pictures are laterally of the ordinary size, and include less than the ordinary angle horizontally, but twice the ordinary size and including much more than the usual angle in height.

The idea upon which the adoption of a new form is based is an assumption that the angle of natural vision horizontally is only one-half of the vertical angle. Without adopting this more than doubtful proposition, we may remark the very evident fact that there is a large class of subjects of which the pictorial interest is limited to a very small space laterally, but in which the whole effect is spoiled if a similar limit be applied to the height of the picture. In many views of church interiors, for instance, the interest is confined laterally to the narrow limits of the nave or a single aisle, whilst vertically it is desirable to take in everything, from the base of the columns to the roof. To secure this it is often necessary to use a lens of short focus, rendering the important objects in a diminutive scale, and including others not needed. In the new form of slide, noble columns and lofty arches, surmounted by the tracery of an ornamental groined roof, are seen in fine proportions; nothing cut off in the height which is necessary to the effect, nothing superfluous in the width not required in the subject. So of natural glens and gorges, or avenues of trees, in which height is a material element of the natural beauty of the scene. In the stereoscope subject the most uninteresting piece of foreground, which could pictorially be very well spared, is of great value in giving space and distance when viewed in the stereoscope, and hence it is often important to retain that which at first sight would be cut off as a matter of course. It will be seen, we think, that for many subjects the new form has a special fitness, and will give a new value to the stereoscopic rendering of many scenes.

Many of the subjects taken by Mr. Warner in the new size, for the new form of instrument, are very fine, and admirably illustrate the peculiar advantages to which we have referred. They are described as being printed by the "new argento-carbon process of the inventor, the whole of the sulphur being eliminated from the paper, and albumen and a pure carbon substituted in its place; thus they are really as permanent and indestructible as they can be made." Of the meaning and value of this description we can give no explanation, beyond stating that the prints resemble good gold-toned silver prints, and are stated to have acquired by some treatment immunity from fading. The stereoscope, which is made in different ornamental patterns, is, we understand, patented, and will be introduced to the public by Messrs. Murray and Heath.

PHOTOGRAPHIC PIRACY OF ENGRAVINGS.

Our readers will remember a recent case of conviction for infringement of copyright in which Mr. Beal, of St. Paul's Churchyard, was fined £130 for the sale of twenty-six photographs of copyright engravings, the penalty of £5 being exacted for each sale. At the hearing, Sir Robert Carden refused to state a case for a higher Court, believing the matter to be one beyond doubt or question, both as to the offence and the penalty. On Thursday, the 23rd ult., application was made at the Court of Queen's Bench before Mr. Justice Blackburn, Mr. Justice Mellor, and Mr. Justice

Lush, sitting in banco, for a rule directing the magistrate to state a case for the opinion of the Court on certain points raised. The case is reported in the *Daily Press* as follows:—

EX PARTE BEAL IN THE MATTER OF CERTAIN CONVICTIONS UNDER THE COPYRIGHT ACT.

This was an application in the matter of twenty-six convictions by Sir R. Carden, under the Copyright Act, for the sale of photographs of paintings, or engravings therefrom, without the consent of the owner. Twenty-four informations had been laid by Mr. Graves, under the Art Copyright Act, 25th and 26th Victoria, cap. 68, for unlawfully selling photographs of certain of his paintings or engravings without his consent as, for instance, "My First Sermon," "My Second Sermon," "Ordered upon Foreign Service," and so forth, the paintings or engravings being registered in those names, and described as "painting in oil," or as "engraving," by such names. At the hearing before Sir R. Carden various legal objections were taken, some of which were rather technical, as that the paintings were not sufficiently described in the registry, &c. The magistrate overruled these objections, and, as he considered them technical, refused to reserve them for the Court by stating a special case. One of the points was certainly substantial in the sense of the practical result. The penalty upon "each offence" being £10, and there being proof of sales of photographs upon two occasions—in each of which eight were sold—it was objected that there were only two "offences," but the magistrate convicted for sixteen offences, and imposed mitigated penalties amounting to £130.

Mr. G. Francis moved for a rule or order directing the magistrate to state a case for the opinion of the Court upon these points.

The Court, however, after a good deal of discussion, refused the application on the ground that none of the points were so far doubtful as to deserve consideration. As to the point of description, all that the Act required was a short description of the nature and subject of the work, and they thought that the description was sufficient. There could be no reasonable doubt as to what were the subjects of the pictures, which were well known. Then it was objected that the photograph was not a "copy" of the painting; but they thought that it was. Lastly, it was objected that each act of selling was only one offence, whatever the number of the copies sold. But the Court thought otherwise—that the penalties were cumulative, and that the selling of each copy was a distinct offence. It would have been a monstrous absurdity if a man might sell a thousand copies at one time, and only pay a single penalty. It would be well worth his while to do so, and such a construction would make the statute nugatory. The object of the Act was obviously to prevent the sale of copies, and therefore the sale of each copy was an offence within the Act. There was nothing, therefore, in any of the points raised to require a case to be stated, and therefore a rule would be refused.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

MR. McLACHLAN'S DISCOVERY—THE NEW INTENSIFYING PROCESS—PHOTOGRAPHY IN THE SENATE HOUSE—CONVALESCENT HOSPITAL FOR PHOTOGRAPHERS—PHOTOGRAPHIC CONVENTION—SEL CLEMENT—CABINET PORTRAITS—SOCIETIES.

MR. McLACHLAN has spoken; and I must confess that, in company, I fear, with many hundreds more, I feel sadly disappointed. The fulfilment does not seem worthy of the promise. I ask myself, what practical information have I gained which I did not possess before? And I am afraid I must answer, very little. I ask myself, what part of my usual negative operations shall I change in consequence of Mr. McLachlan's disclosure? And I fear I must answer, none. And as I had given some faith to Mr. McLachlan's announcement, I feel, as Jonah did when his gourd had been destroyed, that I do well to be angry. And yet I do not charge Mr. McLachlan with breach of faith, or humbug, or some other of the crimes which in pretty little epithets I have heard hurled at his head. I believe that he was perfectly honest in his conviction that he had something im-

portant to communicate, and, with an honourable and liberal mind, he was willing to communicate it to his brethren without fee or reward; nay, at a good deal of actual cost to himself, in waste of time and in travelling expenses, and at the risk, however valuable his communication, of meeting, at best, only misappreciation and ingratitude, possibly gibe and misrepresentation. Looking at all these facts, I feel satisfied that Mr. McLachlan is an honest and liberal-minded man.

But he has misconceived the facts of the case somewhat. I think that he has under-rated the knowledge and capacity of photographers generally, and that he has over-rated the novelty and value of his own mode of working. He has, I think, taken certain known facts of photography, and combined them into a system of working which, as a clever, practical man, he has found exceedingly successful, and that this system has assumed exaggerated proportions in his eyes. I am assuming, of course, that he has "made a clean breast" of his secret, and that no further novelty is yet to come in the promised paper. I must confess that I was a little bewildered by the *viva voce* statement of the case made by Mr. McLachlan at the Society's meeting. He should never have permitted himself to be tempted into a verbal account of the matter. His natural discursiveness runs away with him. I was very thankful to read your report, giving the simple facts of his statement stripped of the redundancy and freed from the digressions of his speech. I was glad to find, however, from your report, and that in the Society's journal, which contains substantially the same facts, that the impression I brought away was correct. I noticed, by the way, that these two are the only reports which have appeared; no attempt to render the speaker's remarks having been made elsewhere.

The gist of the whole matter seems to be, that Mr. McLachlan works with bath and collodion quite neutral, doubtless a wise thing to do where it is possible; which many skilful photographers have done and recommended from the early days of the collodion process, but which only very skilful and neat manipulators have been able to do with success. But I do not see how this is to free the collodion process from the thousand and one ills which it is heir to, or how it is to secure either certainty or permanency of general good conditions. The occult action of light, in giving a power to a neutral silver bath to hold oxide of silver in solution, and to reject iodide of silver, is curious, if true; but is it so? If Mr. McLachlan has still some important information to communicate not yet revealed,* which will give us the promised results, I shall thankfully accept it, and will gladly withdraw any of my remarks which may do him the slightest injustice.

I have repeated the experiment you describe with permanganate of potash as an intensifier, and I am disposed at present to believe that it will prove the most valuable intensifying process we possess. As a rule, I prefer to obtain printing intensity with my iron solution before fixing; but as I am careful to avoid the slightest excess of density, it occasionally happens, with some samples of collodion which lose considerably in fixing, that the negative is then a little weak. The permanganate solution yields beautiful results, giving great brilliancy without any tendency to the coarseness so common when additional silver is piled on the image.

Photography has long been recognized as an art having wonderfully ramified forms of application; but I imagine that it will be long before it attains the kind of recognition in this country that it has secured amongst our transatlantic cousins. I see it stated that on one occasion during the great trial—the impeachment of the President—all concerned were observed to be arranging themselves with a view to effect for a memorial photographic group, which was to be taken as a souvenir of the occasion!

I have recently heard of a magnificent project which, if true—as I hope and believe it is—reflects great honour on the gentleman most concerned, Mr. Mayall. Everybody is familiar with the name of Mr. Mayall as one of the veterans of the art and a most accomplished photographer, and if the project to which I have referred be carried out, his name will be remembered by many generations of photographers. Mr. Mayall has, I am told, recently purchased an immense estate on the finest part of the Sussex coast, on which he intends to build a town. The medical profession, who have for a long time desired to build a convalescent hospital on that coast for members of their own body, but have not been able to obtain land, have made application to Mr. Mayall, who has offered to give them the necessary ground on condition that one wing of such hospital should be devoted to the use of photographers. Thus suffering members of our profession would be brought at once into contact with a fine atmosphere, the best advice, and cultivated companionship. Whether this will be carried out, or not, and how, remains to be determined; but I feel that photographers owe Mr. Mayall a debt of gratitude for the conception of such a magnificent idea.

I see from an American journal which has just reached me that a great convention of professional photographers has just been held in New York to resist the renewal of the bromide patent, to resist government taxation of photographers, and to adopt such united action as might be found beneficial to the interests of the profession. It is pleasant to see that in a country so extended as the United States anything like combined action could be secured in regard to such matters. The most amazing part of the business is, that such a patent as that for the use of bromides could ever have been enforced. A patent was obtained in this country for that purpose at the same time it was obtained in the United States, but no attempt has been made to enforce it here. The evidences of prior use, I presume, are too plentiful in this country.

I have recently seen some excellent prints produced by aid of the "Sel Clement," using a 60-grain bath. Assuming the analyses you recently gave to indicate the actual proportion of nitrate of silver present, this would be equivalent to a 30-grain silver bath. I think, however, that these prints are richer and more vigorous than a plain 30-grain bath would give, and point to the advantage of using nitrate magnesia or some similar substance in conjunction with the nitrate of silver employed.

The demand for cabinet portraits seems to progress very slowly in this country, whilst on the Continent, in all parts, I believe, they have already acquired a recognized and standard position. I have recently seen examples from Germany, Italy, and France, all so fine that I cannot help regretting that the universal adoption of this size lags so in this country.

The London Photographic Society's meeting was, as has been customary with it for some time past, a great success. Mr. Griggs read a capital paper, gave some most interesting demonstrations of the simplicity and value of photo-lithography, and distributed some beautiful examples of his work. Mr. McLachlan made the statement to which I have already referred, and promised to read a paper more fully giving his method at the next meeting. The North London had a conversational meeting. The South had a meeting of an exceedingly interesting kind, at once pleasant and instructive. Members having been invited to bring examples of photography with them, a large number of very charming pictures were exhibited, and formed subjects of conversation.

At the Liverpool Amateur Society Mr. Henderson read a very interesting paper on the use of Photography in Archaeology. At the Oldham Society Mr. Heaton read a capital practical paper on Photography in the Field, in which he paid a graceful tribute to the value of the art articles at present appearing in your pages, and for which I, in common with many of my friends, wish to express my

* Our contributor will see from Mr. McLachlan's letter, in our present number, that he has further information to communicate. His present aim was to get solutions sunned, and then communicate further.—Ed.

thanks to Mr. Robinson. I shall personally be glad when he gets to the composition of figure subjects, which is a subject most interesting to photographers, as comprehending matters not within their control. The other societies have not presented many features of interest.

PHOTOGRAPHY AT THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

THE thirty-fifth annual report of the Royal Cornwall Polytechnic Society has just been issued. The consideration which photography has always received in its exhibitions gives its proceedings an especial interest to all connected with our art. In the section of the report devoted to the Fine Arts the following paragraph refers to the photographic contributions at the last exhibition:—

"The collection of photographs has certainly never been excelled, if it has ever been equalled, at any previous exhibition. Foremost among the exhibitors stands Mr. H. P. Robinson, of London, the beauty of whose works we have had to notice at previous exhibitions. One of his photographs, entitled 'Sleep,' represents two girls, evidently sisters, sleeping calmly and happily, side by side; and the air of peaceful repose and perfect unconsciousness which pervades their countenances is strikingly natural and truthful. Another very creditable production of Mr. Robinson's is a photograph from nature, entitled 'The Sisters.' The subjects are seated together in a chair, intently perusing a pictorial book, the arm of the elder sister being thrown lovingly over the neck of the younger. 'Ralph' is another excellent specimen of photography by the same artist, and equally well worthy of notice. Mr. Nelson K. Cherrill, of Tunbridge Wells, exhibited two portraits, entitled 'Emily,' and 'Idle Hours,' 'A View in Borrowdale,' 'An Old Oak,' and amongst his other productions were several views of the engine works of Mr. Penn, at Greenwich. Mr. T. M. Brownrigg, of Dublin, exhibited four excellent photographs of scenes in Ireland; Mr. William England, a number of pretty and well photographed Swiss views; and Mr. R. Griffiths, of Truro, Mr. Rowe, of Redruth, and Mr. Netterville Briggs, of Leamington, also exhibited several creditable photographs.

ESTIMATING EXPOSURES.

BY ROBERT GILLO.

THE following method of estimating exposures, although not new, is, I believe, too frequently overlooked, and, I feel sure, will be of great service to any who may adopt the same plan.

Being in the habit of doing a great deal of landscape photography, using various lenses to suit the particular view, I have often, after taking a view with one lens, been bothered to know the right exposure for the same or a similar view with another lens. Trying to learn and remember the time of exposure for five or six lenses, each, perhaps, with four or five stops, is useless, and only confusing. I first accurately obtained the equivalent focus of each lens by drawing out the camera until I obtained a sharp image of an object the same size, measuring the distance from the object to the focussing-screen, and dividing the result by four. With a small pair of compasses I measured each stop, and found how many times it would go into the focal length. I have thus one lens 5 3-8 focus, stops 1-15, 1-21, 1-28, 1-36, 1-50 of the focal length; another $7\frac{1}{4}$ focus, stops 1-25, 1-41, 1-60. The exposure necessary is, of course, as the squares of these numbers, near enough for practical purposes; one lens may be thicker than another, and so take a little longer; but this, when once ascertained, can be allowed for. I have a table of all my lenses clearly written and nailed up inside my van and tent. I find I am continually referring to it, and it saves an immense deal of calculation and guessing.

ON NATURAL CLOUDS AND ATMOSPHERIC EFFECTS IN LANDSCAPE PHOTOGRAPHY.

BY NELSON K. CHERILL.

At the close of my last paper upon this subject I stated that I intended writing two more articles: one to treat of the mechanical means by which clouds may be best secured on the same plate as the rest of the view; and a further one, to add a few remarks upon double printing. I have, however, upon consideration, determined to combine these two in one paper, fearing lest, by writing too much upon one subject, I may weary your readers instead of edifying them.

The first point, then, under consideration in this paper, is the mechanical arrangement for taking clouds and foreground on the same plate. The subject may be considered under two heads: first, and most important, the arrangement by which the exposure to the sky is rendered shorter than the exposure for nearer parts of the picture; and, second, the conditions of development to which it is also necessary to attend.

The most perfect apparatus for obtaining the first of these conditions is that of Mr. Johnson, as adapted by him in the pantoscopic camera; in this ingenious instrument, the hood placed in front of the lens contains a sort of diaphragm, in the form of a long slit from the top to the bottom, and this is so arranged that the opening of the diaphragm can be made larger at the bottom (wider, that is) than it is at the top; the light which comes from the landscape and the lens is thus, as it were, tapered off from the foreground to the sky, so that, as the camera revolves, the nearer parts of the picture receive an exposure longer than that of the sky, just in proportion as the diaphragm is wider at the bottom than it is at the top. This arrangement, however, necessitates the idea of a revolving camera. The same principle cannot be applied to the ordinary form of camera with its stationary lens. This is much to be regretted, as a motion so true and perfect, if it could be adopted, would be an inestimable boon to photographers generally.*

Lenses are often fitted with flap shutters intended to be moved up and down during the time of exposure. This plan may or may not be good, according to the quality of the camera; on a strong, well-made instrument, that, when put up, is very firm and rigid, nothing can be better, as a rule, than the judicious use of a flap shutter. The mode of using it is as follows: when the shutter of the dark slide is drawn up, the flap is raised—by the finger and thumb applied to the milled-head—till it stands out at such an angle as will enable about the upper one-third of the plate to be exposed to the light; it should not be held still, however, in this position, but as soon as one or two oscillating movements have been given, a little more of the view—this time, of course, nearer the horizon—must be taken in, till, when all the foreground is almost done, the flap may be turned right up, and the sky taken in for the remainder of the time. This plan is very well in cases where, as I mentioned, the camera is quite rigid, but when there is the least tendency to vibration, or, even with a pretty strong camera, the least awkwardness on the part of the operator, a blurred picture is almost sure to be the result. I have therefore come to the conclusion that the flap or shade to arrest some of the superabundant sky light should be, as a rule, separate from the camera. When only a slight amount of shading is required, it can, I believe, be done better with the cap of the lens than with anything else; the cap being held between the forefinger and thumb, and made to dip down from above the lens, just so as to cut off the light from the sky; the cap should be moved from side to side, and also slightly up and down, giving, in fact, a circular motion. When, however, the shading needs to be of a very prolonged duration, I find it better to cut a rough outline of the view in dead-black paper, and hold this up in front of the lens

* It could, however, of course, be managed by means of a circular front to revolve by clockwork, about six inches in front of the lens; but this would be very expensive, not to say clumsy.

to a similar end. This plan answers most perfectly; so much so, that I would advise any one who often required to make use of these shading dodges, to provide a stick to be stuck into the ground about six inches in front of the camera, and a little to one side, so as not to come into the view; the reason for such an arrangement being that, by its judicious use, the hand can be made to hold the paper shade with much greater steadiness and consequent good effect; or, when a very long exposure is needed, the paper might be fixed to the stick and there left. On one occasion I remember achieving a great success by means of two shades, one to protect the sky in the manner above mentioned, and the other applied to the lower half of the plate, to screen some breaking waves, while I wanted the plate to become impressed with the idea of a group of pine trees, about half a mile across the lake on an island. By means of the double screen I obtained the waves and clouds, and more detail in the trees than could have been obtained in any other way.

It must be borne in mind that there are two reasons for generally wishing to give a shorter exposure to the sky than to the nearer parts of the picture: one is, that the clouds *move*, and therefore would become blurred if left too long exposed on the plate; and the other, that there is often such a much greater body of light from the sky, so that the clouds become completely buried in the development under ordinary circumstances.

Now, whenever the clouds are in rapid motion, it becomes absolutely necessary to use a shade in the event of a prolonged exposure being needed; but when the clouds are comparatively still, as in calm weather is not unfrequently the case, the sole difficulty arises from the tendency to over-intensity, which often arises in the manner pointed out. In such a case, any means which will effectually lower the intensity of the developing action will be found most useful in securing cloud effects. The most effectual means for promoting this end* are, I think, to be found in the suggestions contained in a paper communicated by me to the *News* of June 22nd, 1866. I think the best way to reduce the intensity of the developing action is to reduce the amount of free nitrate mixed with the developer. I have, in the paper referred to, suggested the use of iodide of potassium added to the developer as a means of reducing intensity; but I believe the same effect can be obtained, with a little more expenditure of time, by pouring over the plate, after exposure, a certain amount of water—say the same amount as would be used of developer. Let this well mix up with the silver solution on the surface of the plate, and then pour away (say) one half of it, and mix the developer with the other half; in this manner the ultimate effect of the developing solution in producing intensity will be very materially lessened; and in just that degree will the facility for taking clouds on the same plate with the foreground be, in many cases, increased.

In conclusion, a few words on double printing in its particular application to clouds. The plan which I have found most generally useful is as follows: The cloud negative should be "thin," and, at the same time, very transparent in its shadows. The sky of the landscape negative must, of course, print quite, or very nearly, white. When the print is finished so far, I put the sky negative into the frame, and the print behind it in its proper position; then, outside the glass of the frame, I hold up a screen of the same shape and form as the sky-line of the landscape. The whole is then exposed in the shade; but, during the exposure, the effect produced by the sky negative is modified, as occasion may require, by means of another shade, which is moved about all the time; by the combined use of the two shades—the one to protect the foreground, &c., from the light, and to make a soft edge to the sky-line; and the other, still more to soften down the lower parts of the sky, and otherwise generally to modify the effect—I have been able to produce

the best effects, and in the shortest time: about two or three minutes for each print.

I do not think it at all a good plan to adopt a regular "blocking out" system of double printing for cloud effects; I have tried it, but the result is by no means so satisfactory nor so easy as the plan now mentioned of using two screens. In some cases, of course, one only may be needed; but I have generally found two answer best—one in each hand.

When any moderately dark objects project much into the sky, they may commonly be disregarded in these shading operations, for the reason that, after the light has acted on the paper to almost its full extent, a slight further exposure will not produce any further darkening; thus, trees, the masts of ships, &c., may often, with no disadvantage, have the sky printed right through them without the least injury. For just the contrary reason, great care must be taken where any light portions of the picture cut into the sky line, for here a very slight darkening caused by clumsy double printing will often betray the photographer's secret, even if it does not mar the effect of his picture.

Besides these two methods of securing cloud effects in photographs, there is another plan which, though not strictly photographic, is still often adopted, and that, too, with considerable success, sometimes so much so as to deceive even practised eyes; I refer to the modes of painting skies on the negative, which may be accomplished in many different ways. For a most able paper on the subject, from one whose works are the best testimony to the genius of its author, I would refer to Mr. Bedford's article in the *Year-Book* for 1868, in which the whole subject is treated of in a concise yet comprehensive style.

There is, however, yet one modification of this painting on the negative which I have often tried with great success, and which I have never seen published before; it is very simple, however, being as follows:—Make up a little ball of wash-leather strained over a small roll of flannel; rub up a little Indian-ink, and dab the ball down in the middle of it; then put the ball down several times with a dabbing motion on other parts of the palette, so as to distribute and partly to dry the colour; when the proper consistency is gained—which can easily be seen by a little practice—work on the back of the negative with the ball, by this means taking up fresh colour as needed. In the course of a very short time the back of the negative can be covered over with a film of black paint, which will render the sky much lighter in the print than it would be otherwise; of course only negatives with a "thin" sky can be treated in this manner. When perfectly dry, the clouds can be "taken out" from this darkened sky, and, with a little skill, the effect can be made most natural and effective. A damp paint-brush will be found to produce a wonderful effect upon the thin coating of paint, and in a short time clouds may be made which, as they print *darker* than the general surface of the sky, may be made to serve many artistic purposes, which cannot be served under the usual modes of painting-up skies, as, by the usual plans, the clouds print lighter, rather than darker, than the general tint.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XIV.

"The axiom that the most perfect art is that in which the art is most concealed, is directed, I apprehend, against an ostentatious display of the means by which the end is accomplished, and does not imply that we are to be cheated into a belief of the artist having effected his purpose by a happy chance, or by such extraordinary gifts as have rendered study and pains unnecessary. On the contrary, we always appreciate, and therefore enjoy, a picture the more in proportion as we discover ourselves, or are shown by others, the why and the wherefore of its excellencies; and much of the pleasure it gives us depends on the intellectual employment it affords."—C. R. Leslie.

* That is, of course, after the usual well-known plan of using a stronger solution and quicker development has been found insufficient.

HAVING in the last chapter had a slight glimpse of the value of a knowledge of composition in arranging a figure,

we now come to a consideration of pyramidal forms, a method of composition very suitable to single figures and groups.

It is, perhaps, as well to begin with a complete subject; therefore, as an example containing almost every element of formal artistic composition, and as a subject to which it will

be useful to return again and again for the illustration of various points to be commented upon, I this week select Wilkie's "Blind Fiddler" for my illustration. Well-known and familiar as it is to all, there is scarcely another picture in the whole range of art so useful to the teacher, or from which the student of the art of picture-making could learn



so much. This is not because of the subtilty or ingenuity of the arrangement, but quite the reverse. To those who have the slightest inkling of composition, the art displayed is very noticeable, defying the teaching of those who say "the greatest art is to conceal the art," and that all the artist has to do to produce a work of art is to take a bit of nature, no matter what, and imitate it faithfully.

There is no doubt that the maxim that the art should be concealed is good enough, but it is one of those rules that the student should use with judgment, or it will cripple him. It should be taken in the sense of a protest against academic formalism. Burnett says on this subject, "Concealing the art is one of its greatest beauties; and he best can accomplish that who can discover it under all its disguises. I ought, however, to caution the young artist, on this hand, not to be too fastidious in trying to conceal what can be obvious only to a small number; for in endeavouring to render his design more intricate, he may destroy character, simplicity, and breadth; qualities which affect and are appreciated by every one." And the quotation at the head of this chapter is much to the same purpose.

As regards composition, the pictures of Wilkie may be taken as safe guides by the student. Artists of every shade of opinion unite in regarding them in this one respect as perfect. Even Haydon, whose enthusiasm for grand art and contempt for subjects of a domestic character almost mounted to insanity, acknowledged that, as an artist, Wilkie will be a teacher and an example for ever. Speaking of this

great artist, in one of his lectures, he says, "His composition is perfection; there the youth may consider him infallible: it was the composition of Raffaele in a coarser style." And adds, "My not seeing the beauty of his works at first was entire ignorance; as my knowledge increased, my admiration went with it: exactly as I understood Raffaele, I understood the beauty of Wilkie's art."

The "Blind Fiddler," as far as the arrangement of its materials is concerned, would have been possible in photography; it is therefore a picture of which a long study and analysis will much benefit the photographer.

The composition consists of a series of pyramids built up on and combined with one another. The fiddler himself forms a pyramid, and being the motive of the picture, he is more isolated than any other figure, which gives him greater prominence, although he is not the chief mass of light; so that what Ruskin rather fantastically calls the "law of principality" is observed. But he is not left quite alone, but is connected with the principal group by the figure of his wife and child and the basket at his feet. This basket is made light, to strike the eye, partly to unite the two groups, but chiefly because it is the supporting point of the angle of which the old grandfather's head in the centre is the apex, and which is led up to by the boy in shadow warming his hands at the fire. The two little girls form a pyramid, and so do the mother and child, supported by the dog, which is again continued by the man snapping his fingers, again by the old man, who caps and perfects the whole group.

Notice particularly how the line of one side of the pyramid formed by the mother and child is carried on by the stick in the little girl's hand. All the figures are connected together in one grand pyramid by the dark and light spots formed by the cooking utensils over the fire-place; and the diagonal line is still further carried on by the slanting beam to the left, which again is balanced by the steps leading to the door. The perpendicular lines of the wall give stability to the composition, and the group of kitchen utensils and vegetables in the foreground, being darker than any other part, gives delicacy and distance, as well as scale, to the rest of the picture, and by contrast gives perfect balance to the group.

I have pointed out the leading lines only of this famous picture, sufficient to guide the student in his further analysis of its governing lines; but he will discover that there is not a line, however insignificant, that has not its equipoise and contrast; not two articles together but what have others added to form the group. A good example of this will be seen in the way the sieve and fryingpan on the wall are connected together and grouped by the gridiron and cup, which subordinate group is connected with others, and so on throughout the whole composition. I shall return to it again to help my explanation of other details of composition, such as repetition, harmony, and repose.

What could be more formal, regular, and artificial than this group, and yet what more entirely natural? If art—art regulated by laws—were antagonistic to nature, this would not have been the most popular picture of its year, 1806; nor would it have retained its popularity, and become, as it perhaps is, the best known picture ever painted in England.

CONVENTION OF PHOTOGRAPHERS IN THE UNITED STATES.

A "GREAT mass convention" of photographers has just been held in the United States for the purpose of considering and securing united action upon several subjects of vital interest to the profession. Primarily the Bromide Patent, under which American photographers have groaned for some time, demanded attention. This iniquitous patent having nearly expired, effort was about to be made, it seemed, by the proprietors to secure an extension, to prevent which was one of the objects of the convention.

The meeting was held in the Cooper Institute, New York, and was attended by about a hundred delegates. We condense an account of the proceedings from *Humphrey's Journal*.

After the nomination of officers, among whom were Mr. Bogardus, of New York, President; Black, of Boston; Whitney, of Glenn's Falls; Cramer, of Philadelphia, and a few others. Mr. Bogardus, on taking the chair, gave some good advice to the profession, pointing out how want of unity in action and petty jealousy injured the business, and suggesting that photographers should follow the example of many other professions, and unitedly promote the interest of the business, in place of running one another down by a ruinous competition, as is now the case in many localities. Many letters were read, all protesting against the Bromide Patent and excessive taxation. The President stated that the tax had been repealed since the convention had been called, but that as there might be danger of a new tax law being imposed by Congress it would be well to be wide awake.

Some facts were stated in regard to the first legal decision in favour of the Bromide Patent, which gave strong suspicion that it was a so-called *made-up* affair, and all agreed that the case had never been tried on its true merits. The particulars communicated made the strong suspicion almost a certainty, that the affair was a "swindle all round;" that some photographers had been deceived by their own lawyer and agents, who, after seeing Mr. Hubbard, advised them to pay up. It appears more pluck and resistance would have broken up the affair long ago. It was stated that Mr. McKenna, of Bedford, Me., who was condemned by a court there to pay a royalty to the present owner of the Patent (Mr. Hubbard), was on excellent terms with him; in fact they were staunch friends. On

the strength of this judgment other snits were threatened, and some frightened photographers paid; however, Mr. Wardwell, of Boston, Mass., resisted with pluck, and employed the well-known lawyer, S. B. Brooks, who forced Mr. Hubbard to withdraw his suit, and Mr. Hubbard paid expenses even to Mr. Brooks. Wardwell's counsel, to the amount, it was said, of \$800 dollars.

The following resolutions were then presented by a council appointed for the purpose:—

1. That the photographers are unanimous in resisting the extension of the Bromide Patent.
2. That the committee was authorised to use all ways and means to carry out said resolution.
3. That the old proverb, "In union there is strength," is applicable to this case.
4. That the isolation of individual photographers injures them all.
5. Proposed to organise a Photographic Union for the promotion of the interest of the art.
6. That this meeting shall organise permanently, charging the officers to mature plans for effecting a good national organization in the United States.

The first four resolutions were unanimously adopted, with little or no debate; the last two gave occasion to a spirited controversy about the probability of keeping such an organization alive; and after many members present had ventilated their opinions and made valuable suggestions, Mr. Gurney, of New York, proposed a subscription with the cash down, in order to have a small fund to start with; this was, after little controversy, carried with a large majority. An invitation of the Photographical Society to be present at their meeting the same night in the same building was received. When the day's proceedings terminated, the reporter of our contemporary remarks, "the subscriptions were coming in at a rapid rate, and greenbacks almost rained down on the treasurer from an eager crowd."

On the second day it was moved that to Mr. Gurney, Fredricks, and a few others (who had spent divers sums of money, ranging from \$200 to \$700, in order to have the stamp duty on photographs abolished, and successfully lobbied this through in Congress) should have their expenses returned. It was decided to have 3,500 pamphlets printed to distribute among photographers. The President stated that yesterday over \$400 had been subscribed, of which half had been paid cash down. Next it was proposed to adjourn to the 3rd of July in New York, as then a photographic exhibition is contemplated in this city; this elicited a proposal to reassemble the 20th of May in Chicago; another gentleman proposed Philadelphia. The result of this jealousy was that the meeting adjourned at 12 o'clock M., *sine die*.

Recent Patents.

PREPARING CANVAS FOR ENLARGEMENTS OR DIRECT PRINTING.

BY J. M. LOEWE.

DR. LOEWE is known to photographers as an ingenious and inventive man, who has projected many processes, of which none, unfortunately for him, have come into operation, from want of completion by the inventor. It will be noticed that the description of the following method, which obtained provisional protection only, contains no allusion to the kind of silver bath, or its mode of application, nor to the modes of developing recommended. The specification is as follows:—

I prepare linen, cotton, silk, and other similar material by giving it, firstly, a solution of 2 ounces of gelatine dissolved in 10 ounces of water; I then treat it in the manner hereinafter described with reference to the canvas. I take canvas prepared in the ordinary way for photographic purposes, that is, by using oxide of zinc or lead, and I avoid the use of iron instruments, and use, instead thereof, those formed of ivory or wood for spreading the coating upon the canvas; I then add 1½ ounces of virgin wax dissolved in essence of lavender to 1 pint of turpentine. The canvas is prepared with three coatings and dried spontaneously; and when dry, I dissolve 60 grains of iodide of zinc in 2 pints of distilled water, and, with half a potato and

very fine pounded pumicestone, rub this solution on the canvas, and dry it with a soft flannel till the surface becomes brilliant.

In carrying this invention into effect, I further use the following three solutions: the first for printing out or developing the object on canvas by sunlight; the second for enlarging by artificial light; and the third for printing by contact in a pressure frame:—

First Solution.—To the albumen of 100 eggs I add 10 pints of distilled water, 10 ounces of chloride of sodium, 5 ounces of chloride of ammonia, 60 grains tartaric acid, $1\frac{1}{2}$ ounces carbonate of soda, 2 ounces iodide of potassium, 1 ounce iodide of ammonia, $\frac{1}{2}$ ounce bromide of potassium, $\frac{1}{4}$ ounce bromide of ammonia, $\frac{1}{3}$ ounce pure iodine, 20 grains nitric acid, 120 grains chloride of gold, 1 pint of sulphuric ether saturated with virgin wax, beaten together, and filtered in a funnel hermetically sealed. The solution remains five or six minutes on the material, which, when dry, is rubbed over with a soft flannel until a shining surface appears.

Second Solution for Enlarging by Artificial Light.—I use the same chemicals described in solution No. 1, in the same proportions, but add 3 ounces chloride of ammonia, 2 ounces of magnesium, 120 grains of pure iodine, 120 grains iodine of lithium, and 60 grains of iodine of cadmium.

Third Solution for Printing in a Pressure-frame by Contact.—To 2 parts of distilled water I add 1 part of solution No. 1, and add 150 grains of chloride of sodium, and 8 grains of gold to each pint.

PANORAMIC APPARATUS FOR THE FIELD.

BY CAMILLE SILVY.

THE following specification describes M. Silvy's invention for taking panoramic pictures on sensitive paper.

My invention relates to a new and improved apparatus which, being combined with the camera-obscure now used in photographic apparatus, allows, by suppressing the ordinary frames and dispensing with dark tents, of taking panoramic views on all points of the horizon. This apparatus consists of a tube made of zinc or other metal, or any other convenient substance, in the centre of which is a movable little wooden roller, on which the sheet of paper made sensitive is wound. One of the ends of this sheet is stuck on to the roller, whilst the other end is fixed on another similar little roller placed out of the tube, and which serves to unwind the said sheet through a slot cut in the whole length of the tube. This tube, enclosing as aforesaid the sheet of paper, is then placed in another tube or socket fixed vertically on the left side of the camera-obscure, and, in order to operate, the sheet of paper is gradually unwound at the rear part of the camera-obscure, which is purposely of a circular form, by means of a second little roller which is put into another tube or socket fixed vertically on the right side of the camera. When a panoramic view has been taken, the paper is wound up anew in the first tube, answering the purpose of a sheath, and contains the latent picture, which may afterwards be developed by the ordinary means.

This description is supplemented by a detailed statement, with diagrams, after giving which, the specification proceeds:—

By the foregoing description the panorama of surrounding objects and places, and not of plane images, is taken by a special apparatus circular in form. The camera being furnished with its immovable frame, a lens so regulated as to avoid the necessity of finding the focus, the fresh cartridges are merely introduced and then taken away; the spare frames are done away with, as is also the dark tent, the papers made sensitive not requiring to be renewed, and the cartridges furnished with the papers made sensitive being at will substituted for one another as many times as there are different phenomenas to be taken.

Having thus described the nature of my invention, and the manner of carrying the same into effect, I would have it understood that I do not confine myself to the precise details above given, and illustrated in the accompanying drawings, as these may obviously be modified without departing from the principle of my invention; but what I claim and desire to secure by letters patent is, an apparatus assuming the shape of a tube, or any other form, in which is wound a sheet of paper made sensitive, and which may be developed and wound afresh in combination with a camera-obscure; the frame of which, or the

back, is circular in form, and the sides so arranged as to be able to receive the said apparatus, and allow the partial and circular development of the sheet of paper and its winding in order to take panoramic views on all points of the horizon, substantially as hereinbefore fully set forth and described.

Correspondence.

SEL CLEMENT.

SIR,—On my coming to London yesterday I was shown the number of your paper of the 27th of March, with the few lines it contains on the "Sel Clement." I cannot allow the sort of challenge you seem to suppose I have thrown at the analysts to remain as such.

In my article in the *Moniteur de la Photographie*, and in reply to the excellent Dr. Phipson, I simply stated that to my idea it would not be an easy task to find out the composition of the Sel Clement by means of the ordinary chemical analysis.

The gentleman of your staff who has analysed the Sel Clement concluded to its being absolutely deficient of any organic compound, by stating that no trace whatever of carbonic acid had been formed in the combustion tube. For me, substances containing carbon are not the only ones that are organic; but I consider as such all those which contain either hydrogen or nitrogen. At all events, the apparatus used by your friend was not properly arranged to show any trace of carbon, and it may have happened that the nitrous fumes formed during the combustion have reduced the nascent carbonic acid into carbonic oxide, they themselves being converted into nitric acid. However, I beg to state that some organic compounds—such as sugar, citric acid, &c.—when dissolved in certain reagents, do not exert the slightest reducing action on nitrate of silver, and that they begin to reduce it only under the influence of light, providing the solvent has disappeared, or has been somewhat modified. This, in all probability, explains many a phenomena: for instance, why the Sel Clement is not sensible to light alone; why the albuminized paper, sensitized, remains white; why it becomes yellow after a time, when some modification has taken place; why the simultaneous action of the albumen and chlorine of the paper and of light is required to effect the reduction necessary for printing; why, in the first moments of printing, the reduction is slow; and, finally, why, after a certain lapse of time, the reduction goes on at a quicker rate. Magnesia, no doubt, contributes effectually towards these results; although, to my belief, its influence has been greatly exaggerated in what has been said about it in the papers. Lastly, I have some very serious reasons, grounded on experiments, to believe that the organic compounds introduced, as stated above, in the preparation of the salt, are not removed from it by either evaporating or boiling.

But here I must stop. It is no business of mine to commit myself into indiscretions, or to enter into polemics. You yourself, Mr. Editor, will neither allow it or wish for it, especially when you are made aware that I know with positive certainty that a counterfeited Sel Clement is sold in London, and that on no small scale. The following is an analysis of the counterfeited product:—

Nitric acid	...	...	...	...	39 25
Metallic silver	...	...	...	...	25-20
Magnesia	...	...	...	...	9-10
Copper	...	...	...	...	traces
Lead	...	...	...	...	traces
Oxygen	...	...	...	...	1-85
Water	..	...	...	...	24-60

10,000

Is it to be wondered at that the Sel Clement should present irregularities? That the percentage of silver should vary? That the results obtained in the keeping, the printing, &c., should be contradictory? You will surely admit, with me, that I cannot possibly be made responsible for the evil effects of such counterfeited products as this one!

In consequence of these facts, I think—and I hope you will think with me—that some measures ought to be taken to safeguard the interest of the public and my own against dishonourable competition. Henceforth the 10-ounce bottles will have in relief, on the glass, these words:—"Sel Clement" and

"Preservative Nitrate of Silver." The corks will be sealed with my agents' trade-mark, a "Hammer and Pick," and the labels will be signed "R. Clement." In consequence, the consumers are requested to look carefully for, and to claim, those unmistakable signs of a genuine product.

Be so kind, sir, as to insert this letter in your paper; and accept my sincere thanks for your kind intervention in this occurrence. I only ask for my product to have a fair trial. If it should prove advantageous to photographic science, I have my reward; if not, none but myself suffers loss for my long and careful working and experiments to obtain this end. If it does what I say, and saves the employers much money, why should it not be used without disputing about its composition? With the new and explicit directions which will be now printed (I send you copy) I am confident of success.

The gentlemen (Messrs. Johnson, Matthey, and Co.) who have consented to take my agency for England, its colonies, America, and Germany, are doubtless known to you, and their name is guarantee that what is supplied from them is my genuine product, for the composition and success of which I am alone responsible.

It is necessary for me to say that the new bottles and labels are not yet made, and that stocks just now sold are not so distinguishable; but protection can be had by only buying direct at present from these gentlemen, or their business customers who have had it from them.

Accept, sir, the expression of my high consideration.

THE MAKER OF THE "SEL CLEMENT."

Paris, April 25th, 1868.

[We have received with this letter a number of exceedingly brilliant and rich proofs printed with the Sel Clement.—ED.]

MR. McLACHLAN'S DISCOVERY.

MY DEAR SIR,—Let me commence by thanking you for the tone of your leading articles. The neutral position you have confined yourself to might have been followed by your contemporaries with greater justice to me, at any rate, if not ultimately to themselves. You are well aware of the circumstance that caused me to give such a hasty outline of my process. Many others were equally well informed. I should have thought that the fact of my being stopped speaking because of the lateness of the hour would have prevented others going into detail for me. There was much that I wished to say, had time allowed, apart from the chemistry of the process, that must have struck any one with the least reflection. Upon my return to Manchester many of my friends waited upon me for further particulars. I explained to them many things which were not stated at the Society's meeting, and that would have been mentioned had time allowed. I only state some of them now as there is a probability of my being forestalled in another quarrel.

At present I consider my process as having been given in confidence to the photographic community, until I am allowed to read my paper. I would strongly advise all who mean to try my process, to further the sunning of their silver, and to add no potash. A small quantity of the silver, after sunning, may be taken from the bulk, to which add a drop or two of caustic potash (strength one grain to an ounce of distilled water), and then note the change. I think it is reasonable to suppose that if reflectors or lenses were arranged so as to throw as much light as possible upon shallow cells or dishes made so as to present as much surface as possible to the light, the preparation of the silver might be hastened. It also struck me to try the effect of Wilde's large electrical machine. Many other things I have mentioned to my friends, and asked them to take notes, for fear I should have my own ideas reproduced by others.

So far as any certain knowledge of the kind of change that has taken place in the silver, I cannot say; but my theory, I think, is quite as rational as any that has been advanced, and as I differ with all, the more credit to him who turns out to be right. My theory, of which further explanations in my paper, is the same I informed you of in London; viz., oxygen absorbed by the silver from the water, actinism and heat combined changing it to a kind of ozone. I have thought it might be possible to prepare a bath at once by the introduction of ozone. Different methods of preparing it might be tried. As it is rather mysterious in itself, it would have been better for Mr. Spiller, after having presented his report, had he

allowed me to make a full statement; for I am sorry to say he has misunderstood my written directions, a copy of which is in my possession. Indeed, he has not performed or properly described any of the experiments; and if the silver is prepared as he states, nothing but failure can ensue. In making this remark I have no option left me; if I had, I should have passed by Mr. Spiller's article, for I must either admit or disprove what Mr. Spiller has said.

I will now state what I know to be facts. Mr. Spiller wrote to me, March 2nd, to tell me that he had placed 700 grains of nitrate of silver dissolved in 5 ounces of water (ordinary nitrate). By return of post, in a letter dated March the 4th, I sent him written instructions as he desired; and it was only after my written instructions that he placed a second bottle of silver in the light according to my directions. I had never been informed that he had been making an experiment of his own by introducing chloride of sodium in the bath. Whether this is the cause of the change, or not, I will not undertake to say; but this is not my experiment. The silver, notwithstanding being tampered with, dissolved 20 or 30 drops of the potash solution, and remained perfectly clear. I was also told the bath was saturated with iodide of silver. Yet, upon adding many ounces of water to make to proper strength, it still kept perfectly clear. The great quantity of potash caused an alkaline reaction, and although in every way prepared contrary to instructions, clear pictures were obtained. Both bottles of silver were tested most carefully after sunning, and they were found to be perfectly neutral.

Coming to the bath, prepared so far according to my directions, and which had only been exposed something about half the time of the other, in condition (so far) as to allow my experiment to be fairly tested. This bath was spoiled through Mr. Spiller incautiously adding a great excess of potash. But he himself admitted to me that it dissolved a great portion of the oxide. These facts being witnessed by myself, I am bound to state them; and, taken in conjunction with his mistaken description of my process, I cannot come to any other conclusion than that he quite misunderstands every thing.

Mr. Editor, you take upon yourself to call my experiments empirical. Compare them with Mr. Spiller's; for did it never strike him or you that the same result might have been obtained without the addition of chlorine? I have no doubt it would have been if he had tried. If this is how chemistry decides, Heaven preserve me from having anything to do with it!

I should have stated, that before any experiments were tried by Mr. Spiller, I would not be bound by any of the results, as the silver was not of the proper kind, or the exposure long enough, considering the time of the year. This was not Mr. Spiller's fault, as I could not obtain for him at that time the proper silver. It was not likely I was going to run the risk of failure. Yet, for all this, the fact was fully proved that by exposing neutral silver to light, it would dissolve oxide of silver. I never meant any one to experiment at all, but simply to report upon certain alleged facts, and to give an opinion upon their value. Of course I did not object to experiments, but I knew the risk of failure through mistakes, such as actually occurred.

I again affirm that up to the present day we are in the same helpless condition. So far as any published information goes for our guidance, there have not even been proper directions given for the making of an iron developer, and there is positively no common-sense or reliable direction for preparing a silver bath. There is as great a lack of knowledge of the collodion. It has simply been a question of process with us. The great difficulty lies in ridding the bulk of photographers' minds of this fallacy. This is plain speaking, for I cannot afford to be a hypocrite in this matter, after having gone through the mill, as I have done, for my information. There is the right spirit in all the letters that have appeared in your journal.

After having read my paper, I will willingly answer all questions. My only object is the elucidation of truth. This can only be obtained by a diversity of opinion in friendly controversy, and if this is kept up I am sure the ultimate end of this discussion will advance our knowledge of the true principles of photography. I consider the London Society in honour bound to put my assertions to the test. This can easily be done by the organizing of a committee. This would put the whole affair in a nutshell; and if they should find out, like Mercurio, that I have not made a breach as deep as a well nor as wide as a church door, it is enough; it will kill a vile system of work-

ing that has daily sent hundreds home with minds distracted, and, no doubt, some to an early grave. Again I say, let us have trial by battle; so organize your committee.—I remain, yours truly,

LACHLAN McLACHLAN.

Stamp Office Buildings.

9, Cross Street, Manchester, April 28th, 1868.

MR. McLACHLAN'S DISCOVERY.

SIR,—I do not see how due credit can be given or justice done to Mr. McLachlan on account of the discoveries he has made and so generously given to the public, if, after inducing him to divulge his secret and getting his promise to read a paper at an early date, we try to anticipate him in any way. I think that all are in honour bound not to do anything until Mr. McLachlan has stated his own case, especially as, owing to the lateness of the hour, his verbal communication was cut short, and several matters omitted.

Since Mr. McLachlan's return to Manchester, and before any notice of an article to be forthcoming in the *British Journal*, I and several friends had an interview with him, in which he stated that the period of preparing the bath might be shortened by throwing a strong body of light by means of lens, condensers, or reflectors, through shallow glass cells or dishes made so as to present as large a surface as possible to its rays. He also stated that a bath might be prepared at once by the introduction of ozone, either electrically or any other way. Many other applications of his ideas were given by him, too numerous for this letter, but of which notes were taken.

I do hope photographers, as a body, will sympathise with the man who freely gives to them the fruits of his brain undeterred by the shallow-pate who, in every photographic circle, is so ready to get on his legs and say, either he had done the very same thing himself, or else had seen his grandmother do it.

Several gentlemen of standing in this city are aware of this letter, and, agreeing with its contents, would gladly have appended their names to it had time permitted me to wait upon them.—Yours truly,

J. E. WALKER.

Manchester, April 28th, 1868.

MR. McLACHLAN'S DISCOVERY.

SIR,—Whilst very unwilling to prejudice Mr. McLachlan, or come to a decision before his statement is completely made, there are one or two questions which I should like to add to those already asked in your columns.

If a collodion contains sulphuric acid, or something analogous to it, will not adding caustic potash produce sulphate of potash, or something analogous to it? Will not this produce in the bath sulphate of silver, or something analogous to it? And is not sulphate of silver a cause of pinholes?

Supposing Mr. McLachlan's statement of facts to be correct, how will it prevent the accumulation in the bath of ether and alcohol, and, from these, occasionally, fusel oil and other impurities, and also the changes by which aldehyde, formic acid, &c., arising from the oxydizing of the alcoholic accumulations in the bath?

Several other difficulties occur to me, but I will not now occupy your space with them. I do not ask these questions in a captious spirit, but with a sincere desire to have such difficulties resolved, if Mr. McLachlan can effect that desirable end.—Yours obediently,

F. C. S.

[The first series of questions may be answered in the affirmative. Sulphate of potash, being insoluble in alcohol, would be precipitated if formed in any appreciable quantity. We avoid the discussion of the question until Mr. McLachlan has made his full statement.—Ed.]

INSENSITIVE SPOTS IN MORPHINE PLATES.

DEAR SIR,—I have commenced this season with some experiments with morphine plates in which I have met with a difficulty which I do not find in any of the articles or correspondence in the *NEWS* relative to that process. It consists in sundry insensitive spots over the plate, varying in size from one-eighth of an inch down to a mere speck, shading off to the edges. I see when I wet the plate where these are about to develop themselves (not before), as they appear to resist the water for any length of time; and when it is poured off, then show themselves as dry spots. The bath and collodion produce excellent results used in the wet process. The morphine bath

I have renewed, and also filtered several times carefully, and have used both in a dipping and also a horizontal bath, the first of gutta-percha, the last of glass.

Can you point out the cause of these spots, and a remedy for them, as in other respects the process is satisfactory, and is much less trouble than the collodio-albumen, which I have also tried?

Your new intensifier and McLachlan's process are both matters which appear to me to be most interesting novelties.—I am, yours very sincerely,

F. LANE.

Rotherham, April 27th, 1868.

[Can any of our readers throw light on this difficulty? It is one we have not met with.—Ed.]

Talk in the Studio.

CHLORIDE OF GOLD FOR SECRET WRITING.—During the late Fenian trials it transpired that chloride of gold was employed amongst members of the Fenian Brotherhood as a means of secret correspondence. A tube of the gold salt was found on the person of "Colonel" Burke when he was taken, and some crystals of sulphate of iron were found secreted in the toe of a stocking carried into the prison to Burke by a woman who brought him clean linen. Writing made with a solution of chloride of gold remains very faint and imperfectly visible until treated with a reducing agent like sulphate of iron, which at once darkens it and makes it clear and vigorous.

HYPO IN MOUNTING CARDS.—We have had several serious examples of the presence of hypo in mounting cards brought under our notice. We shall have something further to say on the subject shortly.

FIRE IN A STUDIO.—A fire occurred a few days ago in the studio of Messrs. Palmer, of Truro, which was happily extinguished before serious harm was done.

SOIREE OF THE MICROSCOPIC SOCIETY.—The annual *soirée* at King's College took place on Wednesday evening week, and was attended by upwards of 1,200 members and visitors. The exhibition of instruments, prepared objects, drawings, and photographs was very extensive and interesting, and altogether the display, as well as the attendance, exceeded any of the former notable entertainments of this excellent and rapidly increasing society. Amongst the photographs were beautiful specimens of the carbon process by Mr. Mayall, and of the process by Mr. Woodbury. The Rev. J. D. Reed obtained excellent illuminating effects by his new double hemispherical condenser, with flute-key adjustment of the diaphragm tongues for regulating the illuminating pencils. An exceedingly good result was obtained in Messrs. Murray and Heath's improved stereoscopic and pseudoscopic binocular microscope, in which an uninterrupted view of the object is secured in one body, the instrument being also usable as a unioocular arrangement. Some fine micro-photographs were exhibited by Mr. How, who in the course of the evening threw some interesting examples on the screen.

To Correspondents.

J. ROBERTS.—To enlarge four times with the lens you name, the equivalent focus of which is, we believe, 8 inches, you would require a copying-box extending 60 inches: 10 inches between the object to be enlarged and the lens, and 40 inches between the lens and the sensitive surface. The rule in enlarging is, that the distance between the lens and the enlarged image should be as many times the focus of the lens used, and one time more, as the number of diameters the image is enlarged: thus, in enlarging four times with a lens of 8 inches equivalent focus, the distance is 4 times 8, and once 8 added, making 40 inches. The distance between the lens and object will vary between the length of the equivalent focus and double that focus: thus, for enlarging two times the distance between lens and object would be $1\frac{1}{2}$ times the equivalent focus; for enlarging four times the distance would be $1\frac{1}{4}$ times the focus. We repeated the table in question every year up to 1865, and then the demands on our space compelled us to exclude it. You can procure the *YEAR-BOOK* for 1865 still. 2. You can get black tones in the sulphocyanide toning bath by using a strong negative, printing deep enough, and toning long enough, but not too long. The strength of the sensitizing bath is not important, so long as it contains silver enough for the salting of the paper. A bath which will give good results with other toning baths will with this. The question of the additions you mention is not important. On the whole, an advantage is found in toning when they are present.

EARNEST.—In using a stereoscopic camera with one lens and Latimer Clark's sliding bars, the principle to be borne in mind is, that the camera must, in moving laterally, describe an arc of a circle of which the sitter or object to be taken is the centre; and the bars must be adjusted to different degrees of convergence for different distances, in accordance with this principle. When this is properly done, you will have no trouble in securing images which will combine. To assist in adjusting, mark the size of the picture, forming one-half of the slide when mounted, on the ground glass; focus the subject so as just to come within the lines when the camera is placed at one extremity; then move it to the other extremity, and if the adjustment be correct it will again just come within the space marked. It is the ratio of convergence rather than the length of the bars which regulates the proper position. Thanks.

W. J. A. G.—With the aid of a lens, using one eye, you obtain such an effect of relief as can be represented by light and shade; with the aid of the stereoscope on a properly produced slide, you get such an actual perception of relief as can be obtained by using two eyes, and so obtaining a view of two sides of an object; and the stereoscope is of no service in examining a picture which has not been taken from two distinct angles, such as those seen by the right and left eye. In using one eye, if the head were held perfectly still, no perfect conception of relief and distance could be formed; but nature is very beneficent, and readily provides compensations: by moving the head slightly, a view of all objects around, from two points similar to that seen with two eyes, is obtained. Where a person has not the good fortune to possess the use of both eyes, this means of compensation is unconsciously and valuably used; but the use of the stereoscope is one of the things, unfortunately, under such circumstances, quite lost. 2. The spot in the centre of the negative, under the circumstances you describe, is flare; its cause has been the subject of much discussion. It is believed by the best authorities to be an image of the stop, very much out of focus. It is chiefly found in portrait and similar combinations, and is most annoying where long exposures are necessary. Using a stop in front of the lens aids in getting rid of the spot, as also protecting the lens from the full light of the sky by shading it during exposure. 3. The photograph enclosed is very good indeed, and the tone excellent.

G. C. C.—The pink tone of the pictures forwarded is due to a general reduction of gold on the lights as well as the shadows. Sometimes, with a toning bath in good working order, if the prints be exposed to light during the process of toning, a similar result to that sent will be produced. It is probable that you have added some salt having a reducing tendency to the gold solution; but, of course, we cannot tell what. The colour of gold in subdivision depends on the size of the particles, and varies from a ruby tint to purple black. The size of the particles much depends on the mode in which the gold is thrown down.

GLADIATOR.—We can readily understand your explanation. The matter was too trivial and unimportant from the first to be worth half the attention it received. We corrected a blunder, and had no further interest in the attempts to ignore it. Your view of the matter was unquestionably sound. We hear from you too seldom.

ELECTRO.—Judging from the appearance of the print, we should think the cause of the want of richness in tone is due to the negative. With greater intensity in the negative, permitting deeper printing in the blacks without over-printing the lights, richer and deeper tones would be obtained. Probably a somewhat stronger printing bath would also help you. The lighting and general effect of the picture are good. It only lacks a little depth and richness. 2. Sulphocyanide of ammonium can be purchased of any photographic chemist or dealer. We do not remember its present price.

OXONIENSIS.—It is very difficult to say how long a commercial sample of collodion will keep good of which we do not know the exact constitution. It is probable that if you add from half a grain to a grain per ounce of bromide of cadmium to the quantity, and put it away in a dark, cool place, that it will keep.

PERMANGANATE OF POTASH.—Mr. Whitfield, of Scarborough, calls our attention, and that of enquirers respecting permanganate of potash, to his announcement in our advertising pages on March 27.

D.—Good ordinary water colours answer perfectly for tinting prints on albuminized paper. "Harmonious Colouring Applied to Photographs," published by Newman, Soho Square, gives full particulars.

AMATEUR.—There are various formulæ for preparing paper for enlargements. That employed by Mr. Solomon for enlarging by the magnesium light gives good results. It consists of 15 grains of iodide of potassium and 5 grains of bromide of ammonium to an ounce of water, and exciting on a 60-grain silver bath containing 10 minims of acetic acid in each ounce; develop with a saturated solution of gallic acid. You will find various articles on the subject in our back volumes. See, also, our YEAR-BOOK for 1865. If those particulars are insufficient, write again.

COLLIDION.—You leave us in the dark as to your exact manipulations in the morphone process. You remark that you follow implicitly the instructions in our YEAR-BOOK, and then refer to an iron developer without acid, which is not recommended there. It

is probably in this point that you err. The iron solution without silver has, we find, been a frequent source of failure. If you use the iron developer, add silver to it before applying it to the film. If you want a long keeping process, we do not recommend it. It is best suited to those who wish to prepare for a few days' work, not longer. As a rule, the conditions of long keeping involve the necessity of long exposure; and in that case we know of nothing better than the collodio-albumein, with a final wash of gallic acid. Mr. Gordon's modified gum process keeps well, and gives very fine results; but we have not had personal experience with it. We cannot tell the cause of the tardy development of your England's plates. The darkness of the subject was the probable cause. In our own experience, development has been completed in a quarter of an hour. Mr. England occasionally found, with difficult subjects and imperfect light, that the development was tardy, and in such case accelerated it by using alkaline pyro. 2. The deposit you describe was probably carbonate of silver, caused by the presence of a carbonate in the water. Your letter did not contain the crystal of which you speak. We are not very familiar with the collodion you mention, but have no doubt that it is good, and that, with the addition of bromide you propose, it will answer for dry plates. 3. It is generally due to the presence of some organic impurity in the nitrate bath.

ARTHUR STRIDE.—Avoid the washing in salt and water, and omit the addition of carbonate of soda to your solution of chloride of gold. This will give you a better chance of rich and deep tones. Use your fixing bath just twice the present strength. You are using it 1 part of hypo in 8 of water; it should be 1 part in 4 of water. Let us know the result.

THE VIPER.—The subscription to the London Photographic Society is one guinea per annum and one guinea entrance. To become a member you must be proposed for election by a member. As a member you will receive the Society's Journal monthly, as well as the general privileges of membership.

THOMAS STOTHARD.—We will make enquiry as to the formula for developing containing sulphate of zinc. Many photographers use the common crystals of nitrate of silver for every purpose, and find them answer well.

J. H. (Stonehouse).—We have frequently had similar spots brought under our attention. We cannot with certainty state their cause, but believe them to be the result of minute air-bubbles formed on the print whilst in the fixing bath, which cause spots of imperfect fixation where they occur.

G. D. LYON.—The causes of structural markings are known by collodion makers, who generally try to avoid the defect; but it often happens in this, as in many other things, that the best results are obtained when the conditions are nearest to, but just avoid, certain defects. In the case to which you refer you do not state sufficiently precisely the nature of the markings. They may be due to a glutinous condition of the collodion, which renders it difficult to get an even, fine film; or it may be due to moisture, causing crappiness in the film. Coating a plate in a damp atmosphere will often produce the latter defect, even with a good collodion. If you describe more precisely the nature of the defects we can give you fuller information.

JOHN HAMPTON.—We believe the card you enclose is toned in an acetate bath; but quite as much depends on the excellence of the negative as upon the mode of toning. 2. There is no very simple work on the subject. Various of the manuals contain much information; these, and our own pages, are the best guides we can recommend you.

W. F. MORGAN.—Thanks. The qualities of the pictures are very good indeed. Your application of the process is very successful.

D. GRANT.—A good half-plate lens will answer for taking the various sizes you require; but it will require a long room to produce card pictures with such a lens.

EDWARD B. FENNESSY.—Thanks. The idea is a good one, but it has been extensively carried out already.

D. J. W.—Respecting your wish expressed last week we can give you some information if you send us an addressed envelope.

E. SPENCER.—The colours you mention are good for all kinds of photographs. 2. There is no better mode of making oxygen for amateurs than the usual method with chlorate of potash and manganese. Other methods have been devised, but not readily applicable for amateur purposes.

W. H. L.—1. The peculiarity of the collodion becoming red and afterwards colourless is not uncommon, especially when methylated ether is used. It will not injure its working qualities. 2. Pure white wax may be used with advantage. By great care in using ordinary bees'-wax, staining the mount may be avoided. We frequently apply it without such stains occurring.

N.—We are unable to give you the information.

DINSDALE AND Co. in our next.

Several Correspondents in our next.

Owing to the extreme pressure on our pages, several articles, including Mr. Bovey's continuation of the subject of Silver Printing, "Copyright and Piracy," "Economical Use of Artificial Light," "Collodio-Chloride Process," "Modified Transferring Process," Literary Notices, and many other articles, are compelled to stand over until our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Camera Printing and Collodion Prints.....	217
Test for Bromides	218
Photographic Piracy	218
Photographic Reproduction of Old Engravings.....	219
Critical Notices	219
On the Occurrence of Hyposulphites in Mounting Cards. By John Spiller, F.C.S.	220
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	221
Pictorial Effect in Photography. By H. P. Robinson.....	222

	PAGE
Observations on the Employment of Sulphocyanides. By M. Civiale	223
Collodio-Chloride. By William A. Terry	224
Proceedings of Societies—French Photographic Society—Oldham Photographic Society	225
Correspondence—Sel Clement—The Panoramic Stereoscope—Modified Hency Process—Photo-lithography—Sources of Success in Operating.....	226
Talk in the Studio	227
To Correspondents.....	228

CAMERA PRINTING AND COLLODION PRINTS.

SINCE the publication in our last volume of a description of a simple means of producing very fine enlarged prints in the ordinary camera, using a collodion film to receive the image, and transferring the film subsequently to paper, we have received many communications on the subject, chiefly from correspondents who wanted help. The two sources of difficulty have been the toning and transferring, upon which we shall offer a few further hints.

Before doing so, one or two further words of explanation as to the origin of this mode of working may be desirable. The method of producing prints on collodion in the camera, and afterwards transferring them to paper, was introduced many years ago by Dr. Moitessier, but did not come into very general use. Some time ago M. Disderi adopted this system of printing, and introduced it into this country a couple of years since as the *email* process, the great beauty and delicacy of the prints generally winning admiration. Up to recently it has been chiefly employed as a means of producing prints the same size as the negative, or rather smaller, the process being regarded as a substitute for albuminized paper printing in the ordinary manner. Until last year no practical attempt seems to have been made to introduce this process as a means of producing large prints from small negatives. Half-a-dozen years ago we produced some such enlargements, and transferred them to paper; but we could not, at the time, work the method fully out, and, leaving it for a more convenient season, overlooked it altogether. Last year it was simultaneously and successfully worked out, without any concert, and unknown to each other, by several able photographers, and the general details, as derived from several of them and from our own practice, described in these pages.

We have repeated these particulars because we have found that an impression prevailed in some quarters that the process was patented, in others that important details were preserved as secrets; and we have heard that a description of the process described as a secret has been vended in the country at the price of a certain number of guineas. We wish our readers to understand that no restriction of any kind exists as to the practice of the process. As to whether other modes of effecting some of the operations than those we have described exist, we of course cannot say; but we know that the method of working we have described is, if properly carried out, efficient and simple, and is identical with the modes employed by many able men. It should, however, be borne in mind, that in this, as in every distinct branch of photography, skill can only come from practice. Experience brings familiarity with minutiae, and success gradually seems to come naturally where failure used to result from the same operation, without the operator being

able to say upon what essential point present success or past failure depended.

The troubles as to the modes of toning are somewhat difficult to meet in any general statement, inasmuch as tastes differ considerably as to the best colour. The tone of M. Disderi's published prints by this process, which are amongst the most successful examples of it, is generally black. It is produced by first whitening with bichloride of mercury, and then, after washing, applying an extremely dilute solution of hyposulphite of soda. The chief defect attending this method consists in a tendency to coldness and greyness. The best means of avoiding this consists in securing a tolerably vigorous image at the outset, as it is difficult to obtain a deep black if the original deposit is thin and weak. A still warmer black may be obtained by supplementing the bichloride of mercury with a weak solution of sulphide of ammonia. We have seen some exceedingly rich sepia tones which were obtained by following the mercury treatment with ammonia-nitrate of silver. The richest black tones we have seen are those obtained by Mr. Burgess, of Norwich, in his Eburneum process, in which a neutral gold solution is employed. The bichloride of palladium, as we have before explained, also gives a pure neutral black. It should also be remembered that warm tints are most easily obtained in the toned and finished picture when the original deposit is warm in colour; hence the substitution of pyrogallie acid with acetic acid in place of the ordinary iron development.

The greatest difficulties appear to have been felt in the transferring process, many examples of excellent enlargement and fine toning having been sent to us spoiled only by failure in the transferring process. It is worthy of note that in almost every instance the failure has occurred where the print has been suffered to dry before removal from the glass, and the collodion employed has generally been of a kind unsuitable for transfer. There are three or four conditions imperatively necessary to uniform success.

The collodion should be of good body, and yield a tough film. A sample yielding a thin, powdery, adherent film perils the success of the operation.

An acid nitrate bath facilitates the film leaving the glass.

After toning, if the plate be immersed for a short time in a 20-grain solution of citric acid, or a dilute solution of acetic acid, the operation of transferring is materially facilitated.

The addition to each ounce of the collodion of a grain of white wax facilitates leaving the glass.

The application to the glass of a solution of bees'-wax in ether, which on being wiped off with a clean cloth will leave an almost imperceptible film on the surface, the presence of which will aid the film in leaving the glass.

The safest mode of proceeding is as follows:—After the picture has been toned and submitted for a few minutes

to the acid solution, and then rinsed, it is placed on a levelling-stand and covered with water. The paper to which the print has been transferred—which may be plain paper which has been coated with gelatine, and dried, or aluminized paper, or the enamelled paper sold for the purpose—having been cut about one-eighth of an inch less than the plate, and wetted, is placed upon the film; the top edge of the film and one side are then turned over the paper, the corner of the turned-over edges is raised, and, if the operations have been rightly performed, the whole will readily leave the glass; the water between the paper and film, draining out, will drive out air-bubbles, and the two surfaces will adhere perfectly. The print is then hung up to dry. Before perfect dessication has taken place the prints should be placed under pressure. This mode of transferring will, after a little practice, be found to present little difficulty, and will give a good result.

Soon after the publication of our last article on the subject, we received a note from Mr. Window, in which he says:—

"I have long used the collodion transfer process you lately speak of in the NEWS, for locket work and highly-finished larger pictures. The former are rolled on a polished plate to improve the surface; the latter I roll, while still slightly damp, on a piece of rough Saxe, to give a rougher surface. The effects to be got in colour on these are extremely good, and I believe they may be considered permanent. I tone with sulphur before transfer, and I have never found the least sign of deterioration."

The mode of giving a texture to large prints here indicated is, we think, worth attention as a means of securing some good effects.

TEST FOR BROMIDES.

THE difficulty of recognizing the presence of excess of other halogens is well known to experimentalists in this direction. In our last volume Dr. Phipson described an elegant test for iodine and bromine in the presence of chlorine. Mr. J. H. Hill, a surgeon of the U. S. army, describes, in the *American Journal of Science*, a ready and sensitive test for the presence of bromine in the presence of chlorine. It was found impossible, he says, to obtain by the ordinary methods of the books a certain and easy recognition of bromine when chlorine was present.

The Fresenius test solution of auric chloride produces, in faintly acid solutions of alkaline bromides, a colouration ranging from dark orange red to light straw colour, according to the strength of the solution. Iodides must be out of the way. Chlorides, however, do not interfere in the least. The following is the best way of applying the test:—Separate iodides by palladium, and after getting rid of excess of palladium by sulphuretted hydrogen, concentrate the solution to about 25 cubic centimetres. Select two test-tubes, of the same size and shape and colour of glass. Into one pour the solution suspected to contain bromide; into the other pour pure water, adding, perhaps, a trace of chloride potassium; add now to each test-tube a drop of chlorhydric acid, and then to each one drop of auric chloride solution. On now comparing the two tubes, particularly in the direction of their long axes, a yellow colour will be observed in the tube containing the bromide, and made very manifest by comparison with the other tube.

The following experiment shows the delicacy of the test applied as above:—One centigramme of potassic bromide was dissolved in one thousand cubic centimetres of water. Thirty centimetres of this solution, compared with thirty centimetres of a very weak solution of potassic chloride, gave a decided yellow colour. This experiment was varied by dissolving a gramme of potassic chloride in two thousand cubic centimetres of water, halving, and adding one centigramme of potassic bromide to the one half. Thirty centimetres of each of the two solutions now tested gave ample evidence of the presence of bromide.

The mixed chloride and bromide should be brought to the state of salts of the alkalis, if necessary, by precipitating with argentic nitrate, thoroughly washing, and fusing with potassic carbonate. If sodic carbonate is used, the subsequent reaction with the gold test is not so decided.

A test for chloride in the presence of bromide as simple and delicate as the above is much needed. The writer has sought long for it, but in vain.

PHOTOGRAPHIC PIRACY.

THE subject of photographic piracy has been frequently and prominently brought under the attention of various legal tribunals lately, and always with damage to the pirates. The recent case, *GRAVES v. ASHFORD*, in which fines amounting to £250 were inflicted, was brought before a higher Court to compel the magistrate to state a case. A rule was here obtained to have a case stated on a somewhat curious point raised. We append a brief report of the application, extracted from the *Times*:—

GRAVES v. ASHFORD.

This case raised an important question under the Art Copyright Act (Lord Westbury's Act) of 25th and 26th Victoria, cap. 68. There were fifty summonses taken out by Mr. Graves, the well-known publisher, against the defendant, for alleged infringement of copyrights in photographs. In one set of cases the complaint related to a photograph of the print called the "Railway Station;" the Act protected the negatives of photographs, and the photograph here was registered by the photographer, who took it from the print and transferred it to Mr. Graves. In this case it did not appear that he was proprietor of the copyright in the engraving (although there is no doubt he is proprietor of the engraving), as it was not proved to be registered, nor need it be so to be protected, as an earlier statute protects it without registration, only the penalty under that Act is only 5s., whereas under the late Act it is £10, a very serious difference. In another similar case, that of the "Second Sermon," it did appear that Mr. Graves was the proprietor of the original engraving. In both cases the photograph was not from one of Mr. Graves's photographs, but from the engraving. There were other cases as to the pictures entitled "The Morning before the Battle" and "The Evening after the Battle." The whole fifty photographs were ordered and delivered at the same time. The magistrate (Sir R. Carden) had convicted in all the cases, and refused to state a case for this Court.

Mr. Poland moved for a rule to compel the magistrate to state a case. His main point was that the photograph was not a copy of a photograph, but of the engraving, and that therefore the proceedings ought to have been under the earlier Act, under which the penalty was not so heavy. He also mooted the two points taken the other day in a similar case we reported—that the registration by the popular name of the picture was not sufficient, and that there could only be one conviction or one penalty.

The Court, however, negatived the two latter points, adhering to their former decision thereon; but they granted a rule to have a case stated on the first point, deeming it worth consideration.

Messrs. Graves and Son are not confining their raid against the pirates to London, but are pursuing evil-doers in the country. A week or two ago, at the Birmingham Petty Session, James Sunderland was summoned for having sold three copies of each of their engravings "Morning before the Battle," "Evening after the Battle," and "The Railway Station." A clerk had been sent down to Birmingham by Messrs. Graves and Son expressly to detect the issue of piracies of which they had received information. The defendant, in conversation with the clerk, told him that they were obliged to be very careful in selling copies of copyright, because of the risk. Defendant, who was represented by Mr. Ansell, pleaded guilty, and asked for time to pay the fines, having offered to give information as to the producers of the pirated copies. Another charge was made against the same defendant, of having sold a copy of "Taming the Shrew," with the name of Messrs. Graves and Son appended, such work not having been issued by them. A fine of £4 in each of the cases was inflicted, and 18s. costs, with the alternative of seven days' imprisonment for each offence in default of payment.

On the same day a charge was made against Mrs. E. A. Hulme for selling twenty-three pirated copies of engravings.

It was shown in evidence that in this case the transaction was between Mr. Brittain, a traveller for Mrs. Hulme, and the purchaser, and that Brittain received the money on his own account. The magistrate expressed his conviction that there was collusion between Brittain and the defendant, and inflicted a fine of £5 in each case, amounting to £115, or a week's imprisonment for each offence. Fourteen days were allowed for payment, on security being given.

PHOTOGRAPHIC REPRODUCTION OF OLD ENGRAVINGS.

In a recent reference to the swift justice which has overtaken photographic piracies of copyright engravings, the *Athenæum* has some good remarks on a neglected field, which is legitimately open to photographers, which might, if properly worked, yield a good return to those engaged in reproduction. The remarks run as follows:—

"Loud have been the complaints and sharp the punishments with regard to pirates of artistic copyright in recent pictures, and the knaves who avail themselves of the property of others with consummate assurance reply that they are encouraging art in the process of their trade. There is one application of this defence which has truth in it. It is, that the dissemination of good and cheap photographs of fine paintings or engravings must benefit art. Has it never occurred to those who offend the law that by producing transcripts of engravings of great reputation and high prices, with expired copyrights, they might serve the arts and fill their own pockets honestly and without risk? Take, for instance, some of the fine prints of Raphael Morghen after Da Vinci and Raphael, 'The Last Supper,' the 'Circles' of the Vatican, 'Mater Pulehræ Delectionis,' 'The Transfiguration,' the 'Aurora' of Guido, the many plates of Velate, and Desnoyers' 'St. Catherine,' 'The Virgins of the Cradle'—'The Fish'—'The Veil'—'The Casa d'Alba'—'The Rocks'—and 'A la Chaise,' or Forster's 'Binde Altoviti'—called Raphael. The prints of Anderloni, Strange, Woollett, Longhi, &c., are, for the most part, unprotected and popular, and, so far as art value may be said to support the defence, superior to what is too commonly pirated. For example, we presume R. Morghen's print after Da Vinci's 'Last Supper' is no longer protected by copyright. The artist died thirty-five years ago, and the plate was engraved more than seventy-five years ago; yet there is not to be had a good and moderately-priced engraving by any hand of this the most famous picture in the world, the demand for copies of which is so great that almost anything sells—electrotypes and casts in low relief, tawdry-coloured German lithographs, vile etchings—at prices which would remunerate the photographer."

One difficulty which stood in the way of the conscientious photographer has been the uncertainty, in many cases, as to the existence of a copyright in engravings which they might desire to copy. In the case of very old engravings, many of which are most valuable, no doubt need be entertained. Where a question exists it may generally be set at rest by reference to the publication line. The Act 8th George 2nd cap. 13 enacts, in relation to engravings, that the name of the proprietor shall be printed on each copy issued, with the date of the first publication; and the copyright continues good for twenty-eight years from that date.

Critical Notices.

THE MODERN PRACTICE OF PHOTOGRAPHY. By R. W. THOMAS, F.C.S. (London: Harrison, Pall Mall.)

This is a new edition of Mr. Thomas's excellent manual, of which we had occasion to speak on its first appearance in a complete form in terms of commendation. A number of valuable practical papers on the various operations of producing a negative had been issued in various ways by the author, and these, when collected together, were found to constitute a very capital guide to practice, and to need little beyond some introductory pages to give them the order and consecutiveness of

a complete treatise. An early demand for a second edition having been made, it appears, with some additional matter, the chief portion of which consists in a chapter on the permanency of silver prints, which will be read with much interest. Some of the views propounded are open, we think, to debate, and we shall probably, on a subsequent occasion, have a few observations to make thereon. In the meantime we can heartily commend a work which is distinguished by a concise, clear, and practical style from one whose name has for many years been held as a high authority in collodion photography. The work is admirably got up, and has the very useful and sensible addition of some ruled blank pages, for the insertion of new recipes and memoranda, which give so much value to works of reference.

ABRIDGMENTS OF SPECIFICATIONS RELATING TO PHOTOGRAPHY. Part II. 1860-1865. (London: Office of the Commissioners of Patents for Inventions.)

The valuable volume before us is a continuation of a project commenced by Mr. B. Woodcroft some years ago, in which he has conferred a most inestimable boon upon inventors and upon all interested in the progress of the industrial arts. The abridgments of specifications give the salient features of every invention for the protection of which by patent application has been made. The volumes are classified, that before us containing everything relating to photography a specification of which has been lodged at the Patent Office. The first part included all inventions specified under the new patent law up to 1860, and the present comprehends all from that time up to the end of 1865. No pains has been spared to make this a complete book of reference, and to give it historic value as a record of the progress of the art, so far as the patent records are concerned. A brief historical introduction gives some of the leading facts in the history of the arts, not connected with patents, commencing where Part I. left off, and continuing up to the year 1865, is also given. The indexes are excellent, giving in one table the names of the inventors, and in another the subject matter of the specifications; the latter is made more valuable by the new chemical nomenclature being appended to substances as well as the old and familiar names. This is a little book which should be in the library of all experimental photographers.

THE ART OF PHOTOGRAPHIC COLOURING, in Easy Progressive Lessons. By DAVID REES. (London: Published by the Author, Broadway.)

The author of the little manual before us appears to hold, with Dr. Johnson, that a great book is a great evil, and presents his lessons in the concise possible style, describing the various operations in consecutive order with great terseness and simplicity. A very valuable feature in the work consists in two cleverly coloured card pictures illustrating the mode of working described. The specimens of colouring will be found valuable, and worth to many more than the price of the book.

LOCAL SKETCHES ILLUSTRATED BY PHOTOGRAPHS. By W. H. WARNER.

MR. WARNER has here hit on a happy notion of issuing photographically illustrated sketches of interesting scenes or places. Each consists of a quarto sheet of stout tinted paper, folded in a large envelope. The sheet contains a brief sketch of the place selected, giving the salient points of interest, and a photograph, consisting of a half a stereoslide, of some important aspect of the place. The examples before us—Tintern Abbey, and Ross and its Neighbourhood—are good illustrations of this kind of work. Each contains such descriptive text as we have described, well printed in red and black ink; a ground-plan, in one case, of the Abbey, and in the other of Goodrich Castle, with one photo-

graph. The whole sells for sixpence, and will, we should think, find numerous buyers amongst visitors to any scene of interest or celebrity. In a commercial sense the idea seems to be an essentially good one, as it will afford a mode of using up odd halves of stereo-slides, and will often serve as a mode of advertising the stock of local illustrations which the photographer may have published.

ON THE OCCURRENCE OF HYPOSULPHITES IN MOUNTING CARDS.

BY JOHN SPILLER, F.C.S.

I HAVE lately been making a somewhat extended examination of the various qualities of cardboard commonly employed for mounting photographs, and freely endorse the remarks made in your leader of the 10th April, upon the importance of instituting such enquiries with a view to pressing upon the notice of manufacturers the necessity of abstaining from the use of hyposulphite of soda as "antichlore." My experimental results prove that with some kinds of white cardboard the photographer's efforts in the direction of thorough washing will be completely set at naught by the large amount of hyposulphites contained in the card and returned to the print in the course of mounting.

The test for the presence of hyposulphite is at once so simple that every photographer has the means of ascertaining for himself the degree of reliance to be placed in the employment of the cards he may have in stock. I prefer for this purpose using the iodide of starch test, which is further useful in indicating the point at which the prints themselves are thoroughly washed. Prepare, in the first instance, a clear aqueous solution of starch, by rubbing 20 grains of arrowroot into a smooth paste with 1 drachm, or less, of cold water; then pour upon it about a pint of boiling distilled water, with constant stirring. Allow the whole to settle for twenty-four hours, by which time the broken starch cells and insoluble matter will have completely subsided. Now dissolve a grain of iodine in three times that weight of iodide of potassium with the help of a little water, and dilute it first with water and then with the clear starch water previously made. The solution will present a deep indigo-blue colour, which becomes bleached immediately by contact with a soluble hyposulphite. Measured squares of suitable size (say carte-de-visite) of the mounts to be tested are then cut into narrow slips lengthwise, introduced into test-tubes, and covered each with a measured ounce of pure distilled water. The cards should be left immersed for twelve hours, or longer, to afford time for a full solvent action to be exerted, and for the liquids to diffuse out from the compact structure of the cards. Having then arranged in a stand a series of test-tubes of about the same calibre, a small quantity of the blue iodide of starch solution is poured into each to the same height, and the liquids to be tested are added in similar quantities (say half a fluid ounce in each case), reserving one tube as a standard of comparison to be diluted with the same bulk of pure water. By inspection of the whole series it is easy to see whether any bleaching action occurs; and should this be the case, an inference may be drawn as to the amount of hyposulphite contained in the cards under examination, by comparison of the several tints with that of the standard tube. It should here be mentioned that the liquids to be tested must be employed cold, for a slight increase of temperature serves to diminish the sensitiveness of the reaction; in fact, the blue iodide of starch itself becomes temporarily bleached upon the application of heat. Proceeding in the manner just now indicated, I tested upwards of twenty samples of cardboard, with the following results: The weights were previously taken in each instance as a rough indication of the substance of the card; but, as will presently be seen, the enamel mounts contained so much mineral matter that their weights must have been out of proportion to the observed thickness. All were uniformly cut to the carte-de-visite size, $2\frac{1}{2}$ by $4\frac{3}{8}$ inches:—

No.	Description.	Weight— Grains.	Amount of Hypsulphite.
1 ...	White enamel carte-de-visite ...	63 ...	none
2 ...	Yellow enamel stereo mount ...	— ...	small
3 ...	White Bristol board ...	59 ...	large
4 ...	Cabinet mount, white ...	55 ...	large
5 ...	Carte-de-visite mount, white ...	44 ...	moderate
6 ...	Cream-laid carte-de-visite ...	48 ...	trace
7 ...	Do. thin ...	37 ...	small
8 ...	Mounting board, cream colour ...	67 ...	none
9 ...	Do. pale buff ...	70 ...	small
10 ...	Do. buff (thick) ...	87 ...	moderate
11 ...	Do. neutral tint ...	46 ...	large
12 ...	Do. pale green ...	48 ...	very large

It thus appears that two samples only out of the twelve were free from hyposulphite, four contained quantities too small to be pronounced hurtful, and the other six were impregnated to an extent sufficient to justify their rejection for photographic purposes. The greatest difficulties are encountered in the selection of white cards, since the material of which they are made requires to be fully bleached, and hence the use of a greater proportion of hyposulphite afterwards applied as antichlore. The cream-coloured mounting-board appeared to present the natural colour of the best rag pulp, and may not have been subjected to any bleaching process, and consequently not required any after treatment with hyposulphite. This quality may therefore be expected to furnish the most reliable material for mounting photographs.

In the case of the neutral tint, another experiment was made after separating the three principal layers of which this cardboard was composed, and the source of the hyposulphite was found to be in the white paper backing thus:—

	Weight— Grains.	Hypsulphite.
Front layer, neutral tint paper	47 ...	trace
Coarse intermediate pulp	48 ...	small
White paper backing	32 ...	very large

This result was confirmed by a similar examination of one of the buff cards, which also contained most of its hyposulphite in the white paper backing. If such a card were left exposed for any length of time in a damp atmosphere the hyposulphite would, no doubt, ultimately become diffused throughout its entire structure; but the above facts show most conclusively that in the ordinary process of manufacture this distribution of a soluble impurity only partially occurs.

Very instructive results were furnished by an analytical examination of the mineral matters entering into the composition of the board, and I was surprised to find that the stiffest and apparently best quality of card contained a liberal amount of Paris white (sulphate of lime), to which no exception can be taken. The white enamel card, No. 1, left on incineration 28 per cent. of white ash, composed chiefly of a mixture of sulphate of baryta and China clay (kaolin), with a small quantity of Paris white. There was no zinc or lead pigment in this material, and the absence of the latter is an important consideration, since lead enamels so soon become sulphuretted. When the requisite degree of whiteness can be imparted by mineral pigments, there should be no necessity to resort to the processes of bleaching, and for such admixture no better material can be selected than the inert baryta-white, which is absolutely insoluble, and incapable of decomposition by ordinary chemical reagents, and is, moreover, to be had of good quality at a low cost. Ultramarine was detected in the green card, No. 12; and the substratum of the neutral tint, No. 11, also contained some imperfectly mixed with the pulp. This blue pigment owes its colour to sulphur-compounds, which are known to tarnish bright silver surfaces, and therefore may be expected in time to have an injurious influence upon the reduced silver entering into the composition of the photograph. Two of the cards, Nos. 9 and 10, of which the former was undoubtedly the higher quality, left, on burning

freely in air and afterwards in a platinum crucible, 12.2 and 7.6 per cent. respectively of ash, which was almost entirely sulphate of lime. Several of the cards were tested for alkaline chlorides, but traces only of these salts were detected.

Since MM. Davanne and Fordos have pointed out the dangers attending the use of Dutch gold and bronze-powders for embellishing photographic mounts, it may be of interest to know that a dilute solution of nitrate of silver enables us at once to distinguish between the true and spurious gold. Whilst gold itself retains its brilliancy, and remains quite unaltered upon moistening with the silver solution, the copper, zinc, tin, and other base metals contained in the bronze substitutes, effect the immediate reduction of the silver in the form of a dark-grey or nearly black pulverulent deposit.

Series II.—Tinted mounting-boards, of various colours, three-sheet thickness, all hacked with white paper of same quality.

No.	Description.	Weight— grains.	Amount of hyposulphite.
13 ...	Cream colour...	44 ...	trace
14 ...	Do. slightly darker	42 ...	none
15 ...	Do. pale ...	45 ...	none
16 ...	Warm buff ...	45 ...	trace
17 ...	Neutral tint ...	46 ...	moderate
18 ...	Do. pale ...	44 ...	small
19 ...	Brownish drab ...	40 ...	moderate
20 ...	Pale green ...	42 ...	large.

Series III.—White cardboard, of two qualities.

Description.	Weight (in grains) of the carte-de-visite size.	
	Best.	Seconds.
Three-sheet ...	38 ...	40
Four-sheet ...	52 ...	57
Five-sheet...	75 ...	74
Six-sheet ...	96 ...	88

All these cards were found to be comparatively free from hyposulphite of soda. They were tested by means of an iodo-dextrine solution containing about 1 grain of iodine (with iodide of potassium) and 100 grains of dextrine in a pint of cold water. The claret colour of this solution is bleached by hyposulphites with as much facility as in the case of iodide of starch. The solutions should be quite cold at the time of testing, since the colour of this dextrine compound is temporarily discharged by heat in the same manner and with even greater facility than the blue iodide of starch.

Woolwich, May 2nd, 1868.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

SINCE the publication of my last article, enquiries have been addressed to me concerning the method to be observed for keeping the nitrates of soda and silver bath up to working strength, it being obvious to the most inexperienced that the usual specific gravity test is inapplicable to the sensitizing solution prepared by the formula I advise.

In reply to the queries alluded to, I cannot do better than quote an extract bearing on the subject from my paper published in the YEAR-BOOK, supplementing the same by pointing out a sure and certain test that all who have eyes may with ease understand. "To keep the bath up to working strength proceed as follows:—Commence operations by mixing enough solution to fill two bottles, numbering each respectively No. 1 and No. 2. No. 1 to be selected for daily use, No. 2 for replenishing waste. When sufficient paper has been floated for present use, filter the working bath back into its proper vessel, and, after all has passed through the filter paper, fill the bottle up to the neck with the replenishing solution from bottle No. 2. By the adoption of these simple means the bath, as a rule, may be kept in good and reliable working condition for any length of time. Should discolouration occur, a little moist kaolin dropped into the bath will remove it." The quantity of

waste in a great measure depends on the care taken in removing the paper from the bath; it is therefore within the limits of possibility, that when excessive caution is observed, the waste will not be sufficient to enable the fresh solution added to keep the bath in good working order. Such will be made evident at once by the appearance of the albumen surface when dried. An albumen surface, when submitted to the action of the silver, soda, and sugar solution, and subsequently dried, should exhibit a peculiar lustre, or bloom (proof that no albumen has been absorbed by the bath); if the glaze, such as I have described, be absent, and its absence is due to an over-weak silver bath, this last will rapidly discolour, and to repair matters a few crystals of silver nitrate must be added directly the discovery is made.

A certain wise contemporary, whose errors I have on more than one occasion had occasion to mention, still persists in advising his clients to steer clear of weak printing baths. He won't have nitrate of soda, and sugar he—perhaps for the first time—abominates. But, in all sincerity, I beg of all my readers to test the matter for themselves. I have done so exhaustively, and can with certainty and a clear conscience advocate its use; and, as a further argument, I might add, that many of the acknowledged finest prints exhibited at the hall in Conduit Street in November last were, to my knowledge, printed by the method I am describing.

And now for a word or two on the chemicals to be employed. In these days of cutting competition, a dealer, even in photographic chemicals, must be possessed of strong moral courage to enable him to resist the temptation to underbid his neighbours, and it unfortunately happens that chemicals afford a field for the exercise of adulteration free from any probability of detection. I would therefore advise my readers to seek—as I find—cheapness in the dearest market, for I hold that where a fair profit is realized by a dealer, as a rule, he would prefer rendering a pure to an adulterated article; and it may be worth mentioning that the mixtures of silver recently advertised afford a greater profit to the vendor than the sale of an equal weight of pure nitrate of silver, which salt, being composed chiefly of a noble metal, cannot, and never will be, sold under the value the metal can at any moment realise in the bullion market. My advice, therefore, is, to purchasers of nitrate of silver, don't be tempted by low prices, but buy of respectable honest dealers, who demand a fair price, and stick to it in spite of competition. The price I pay for the article is 3s. 5d. per ounce in quantities of not less than 50 ounces, and find it cheap in the money. For smaller quantities an addition of twopence per ounce is made. The nitrate of soda must be strictly pure, otherwise I cannot answer for the success of the formula I have advised, as it sometimes happens that the nitrate of soda as sold by the chemists is mixed with carbonate of soda; the result of such admixture is the weakening of the bath by the decomposition that occurs, and which is brought about by the carbonate of soda. The carbonic acid combining with the silver precipitates carbonate of silver, leaving in solution an unneeded addition of nitrate of soda. I have, however, found no difficulty in procuring the pure article in London, but the failures that have arisen from the source pointed out induces me to ask an observance of caution. The sugar may be extracted from the domestic sugar basin, whilst the requisite quantity of water can be drawn from the well or local water-works. Should the water, however, be charged with an excess of inorganic matter, it is advisable to boil the water before applying it to photographic uses.

It may appear superfluous for me to offer advice or directions concerning the operation of floating, but little things help to make mountains, and a word or two in the direction indicated may to some prove profitable. When the sensitizing solution has been carefully decanted into the dish, take a strip of albuminized paper, edgeways, and pass the lower edge of the paper lightly over the surface of the

liquid. This operation removes dust and scum, and stains on the surface of the sheets are thus prevented. When a quarter sheet only is sensitized at time of floating, with the finger and thumb of each hand seize the paper at the opposite corners. The corner held by the left hand should be the first laid on the solution. The paper, kept slightly arched by the right hand, must then be quietly placed on the bath in such a manner that all air is driven before it. To sensitize a sheet of paper in its uncut state, place the centre of its nearest end between the lips, seize the corners of the opposite end firmly between the fingers and thumbs, and lay that end carefully on the bath about midway of the dish; then, by lowering the head, and moving it towards the dish, the paper is pushed forwards, and, with a sliding motion, the whole surface is gradually brought into contact with the solution. A batten may be then placed across the dish, and when the time of floating expires the corners of the paper should be raised, pinned to the batten, which acts as a support during removal, and to which the paper must remain attached until dried; or, should it be preferred, the paper might be removed from the dish without the aid of such batten; in such case the paper should be spread corner-ways across a roller, and so left to dry. The use of American clips for whole sheets of paper is objectionable on account of the liability the paper has to tear, or provokingly curl in such a manner that the wet surface is brought into contact with the back. If the temperature of the drying-room is increased by artificial heat, the paper should be removed from such room, and kept for a short time in a temperature and atmosphere similar to that to which the paper will be exposed while printing. Neglect of this last hint will cause loss from the cockling of the paper whilst under pressure in the frames, occasioned by the expansion of the fibre if the air be damp and the paper dry, or contraction if the atmosphere is warm and dry and the paper damp. When a mucilaginous substance is employed in connection with a sensitizing bath it should never be added in excessive quan-

tity, as it causes a distinct line to appear on the surface of the paper at every pause during the laying it on the solution.

And here I dismiss the silver bath to fill the frames, which must supply matter for my next. The subject of printing I shall deal with in its entirety, offering practical instructions how to perform every known method of producing varied results.

In conclusion, I must ask the indulgence of my readers on account of the delays that occur in the appearance of my lessons; but the reason why is briefly told: after my daily laborious work is done, I find, at times, a weary body but ill adapted for aiding or encouraging mental labour.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

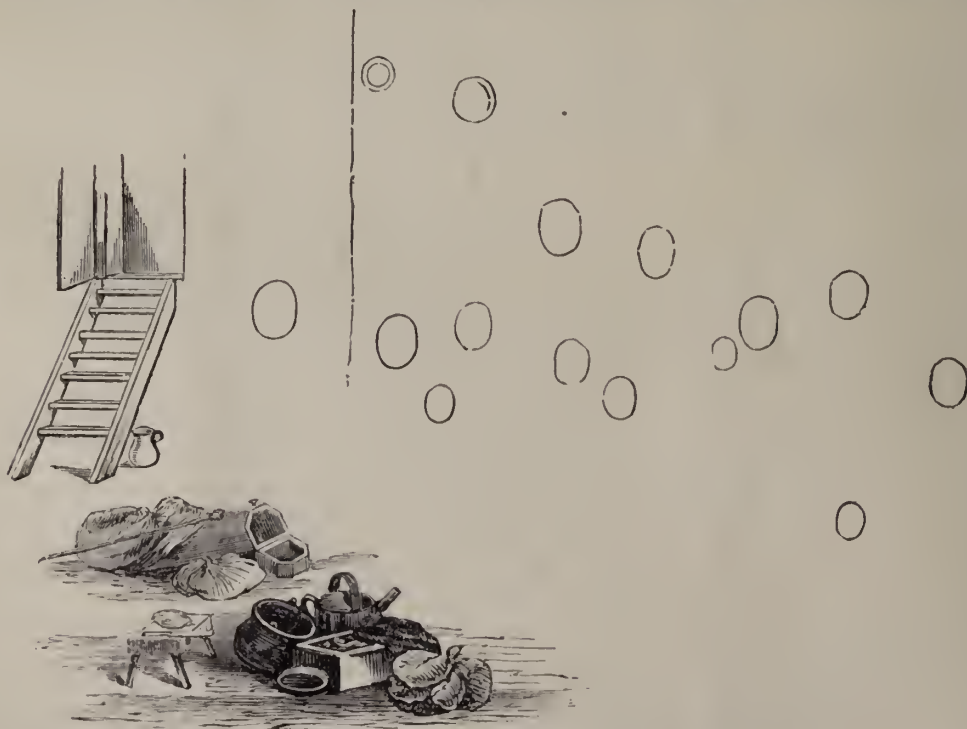
CHAPTER XV.

"How great a share variety has in producing beauty may be seen in the ornamental part of nature. All the senses delight in it, and equally are averse to sameness. Yet, when the eye is glutted with a succession of variety, it finds relief in a certain degree of sameness; and even plain space becomes agreeable, and, properly introduced and contrasted with variety, adds to it more variety. I mean here, and everywhere indeed, a composed variety; for variety uncomposed and without design is confusion and deformity."—Hogarth.

VARIETY AND REPETITION.

For the more easy comprehension of this chapter it would be well for the student to turn to the illustration given in the last—Wilkie's Blind Fiddler.

Notwithstanding the formality of the composition, the great quality without which no pictorial arrangement can be complete—variety—is present in a very marked degree. This is very noticeable in the disposition of the heads and leading points, as will be seen at a glance by the following diagram, in which they are set forth; as will also the pyra-



midal forms of the groups, and the way in which they fall in with and harmonise one another, continually piling up until they form one great irregular pyramid, supported by

the group of dark objects in the front. The extreme care Wilkie has taken to get his pyramid complete will be seen in the disposition of the fiddler's bundle and stick on the

one side, and the spinning-wheel on the other. Every variety of aspect in the heads is given, from the full face of the grandfather to the back of the head of the fiddler's son warming his hands at the fire. Every position is represented, standing, stooping, leaning, sitting, lying, as well as every degree of expression, from lively action to repose, "from grave to gay, from lively to severe;" and every age, from the octogenarian to the infant, youth being directly opposed to age in the centre of the group.

That variety is a necessity in good composition is so apparent that it need scarcely be dwelt upon at any length. It must be obvious that the reverse of variety—that is, monotony—would be fatal to a picture. One definition of composition might be that it teaches the proper use of variety. A line running in a given direction must be balanced and opposed by a counteracting line. Full faces in a group should be varied with three-quarter and profile heads. A line of heads "all of a row," as is too often seen in photographs even by the best photographers, is jarring to a sensitive taste, and is an offence to art. So also with figures dotted about a landscape without purpose, disturbing repose by directing the eye to objects which are out of all harmony with the view represented.

Variety is one of the chief sources of picturesqueness and beauty. This quality alone would make a dead flat interesting. The ever-varying lines of the waves—varying, however, according to regular laws—make the level and otherwise tame and monotonous ocean a constant fascination. No tree, however finely grown and vigorous, presenting an unbroken mass of foliage will interest the artist so much as others, inferior although they may be in size, but presenting variety in their outline and intricacy in their details. Without variety of form there cannot be variety of light and shade.

Notwithstanding the absolute necessity of variety as one of the chief sources of beauty, it may be, and frequently is, carried to excess. All great painters have guarded against this by introducing the opposing element to variety—repetition—repetition as an echo, not that resemblance which produces monotony. Picturesque effect will allow, and demands, a greater amount of variety than beauty, which appears to require a greater amount of simplicity for its success. Variety of attitudes should be studied for the sake of contrast; but simplicity, especially in photographs, must not be lost—the peculiarity of the art itself supplies sufficient intricacy and detail. No amount of ingenuity in varying the positions and aspects of the figures will compensate for loss of simplicity and repose. Photography does not admit of much action. In painting, the model is forgotten; in photography it is different. It is well known to everybody that the figures represented actually stood for some seconds in the attitude shown—except, indeed, in instantaneous pictures, where art often has to accept much from chance (we cannot get away from that fact, even if we desired to do so)—whilst painting or drawing is a representation of something that need not have been seen for more than an instant by the artist; indeed, it is not necessary to the enjoyment of a painting to know that the original ever existed.

Simplicity, symmetry, and uniformity, strange as it may appear, are not antagonistic to variety, but are, in the extensive scale of nature, highly conducive to it, especially in scenes composed of many objects. Uniformity in a single figure will produce monotony; but in a scene composed of many figures it will add to the variety, for if the greater number of figures be irregular and varied, the introduction of repetition in some of the objects will actually increase the variety. This is beautifully illustrated in the Blind Fiddler, in which that "uniformity in variety" which is necessary in a perfect work of art is finely shown. The following diagram exactly repeats the lines of the fiddler and the woman with the child seated precisely opposite to him.

It will be seen that the position of the body is the same in each—stooping a little forward, with the head bent down;

the lines of the arms, the legs, and the chairs exactly correspond, and the line produced by the child's arm reaching up



repeats the line of the fiddle-stick, while both figures, although different in sex, wear caps; the lines of the dress even, especially above the arms, are symmetrical, and in both cases the back leg of the chair is concealed. This uniformity is not accidental, but must have been produced deliberately and with a purpose. There are other similar examples of repetition in this perfect composition; for instance, the boy imitating the action of the fiddler with the poker and bellows. The delight of the human beings repeated in the face of the dog, and, if you like to be fanciful, the rude art of the fiddler echoed in the rude art of the caricaturist in the picture of the soldier on the wall.

OBSERVATIONS ON THE EMPLOYMENT OF SULPHOCYANIDES.

BY M. CIVIALE.*

IN the summer of 1867 I fixed about seven hundred photographic prints by means of the sulphocyanides of potassium and ammonium. I employed them both indiscriminately, and found that three pounds of material was sufficient to tone and fix the number of pictures referred to. The mode of operating which has yielded me the best results is summed up in a few words.

The print is toned a little less vigorously than when hyposulphite of soda is used for fixing; it is washed in two changes of water as it comes out of the printing-frame, and is then immersed for a period of fifteen minutes in a 20 per cent. solution of sulphocyanide. The print loses its intensity in this bath, and assumes a yellowish colour; on its exit from the same it is again washed in two or three changes of water, and then placed in a gold bath rendered slightly acid and containing 25 centigrammes of gold to every litre of distilled water. As soon as the tone of the prints begins to deepen and becomes of a greenish tint mixed with blue and sepia, it is taken out and transferred to a 35 per cent. bath of sulphocyanide, where it is allowed to remain until it has assumed the desired intensity and tone: a prolonged sojourn in the bath causes the prints to assume first a blue and afterwards a bright rose colour. By the employment, therefore, of a bath of this description, pictures possessed of three different tones may be obtained in the following manner.

When the print has become of a black tone, the lower portion of it is removed from the bath: the middle of the picture, representing the more distant portions of the landscape, then assumes a blackish-blue, and afterwards a greyish-blue colour. Two-thirds of the print are now withdrawn, and the part corresponding to the sky only allowed to remain, when a rose-tint similar to that observed by the setting of the sun is obtained on this part of the picture.

Four or five prints may thus be manipulated at the same time and in the same bath; but with a larger number it is impossible to render the necessary attention. The baths may be used until completely exhausted, when they are again

* Read before the French Photographic Society.

made serviceable by the addition of a further quantity of sulphocyanide.

The very simple manipulations which I have here indicated are easily carried out, and if a somewhat longer time is required in their execution than in the hyposulphite method, this inconvenience is largely compensated by the freedom from stains and the necessity of much less washing after fixing by the sulphocyanide process.

A more rapid process, which likewise gives good results, may be employed if desired. Into a litre bath of sulphocyanide (20 per cent. strength) is poured an aqueous solution of 25 centigrammes of chloride of gold rendered slightly acid: the precipitate formed at once redissolves. The proof, after being taken from the frame, is washed as before, and plunged into the bath, in which four or five sheets may be placed at one time. As soon as the toning is sufficiently marked the sheets are withdrawn, and immersed in a 35 per cent. solution of sulphocyanide, and the operation of fixing proceeded with as before. The bath will last for any length of time if the gold and sulphocyanide is renewed from time to time. Leptographic and collodionized papers may be treated in the manner here indicated with very great success.

I will conclude by submitting to the inspection of the Society a print toned and fixed with sulphocyanide, which has been exposed in a window for the space of three months, a portion of it having been screened from the action of the light during that period. No difference is perceptible between that portion of the print which has been covered up and the remainder, which was constantly exposed to daylight.

COLLODIO-CHLORIDE.

BY WILLIAM A. TERRY.*

In a conversation some months ago with Prof. Seely, of the late *American Journal of Photography*, I mentioned results of some experiments, and conclusions derived from them, on the nature of collodio-chloride, which he thought might be of interest to many, and which have been recently recalled to mind by an article of Mr. Lea's on dry plates, and his remarks on collodio-bromide.

When the porcelain picture first began to attract attention,† I procured some collodion from New York and commenced making them; the first bottle I used made very good prints, but that was soon used up, and the next sent me was of a different make, and was not satisfactory. I wrote to my stock dealer for more like that previously sent. He replied, that there was no more in market; that the kind sent last was in common use; and finally sent another bottle which, he said, was fresh, and he knew was good. This on trial proving to be no better than the other, I made some myself with but indifferent success. Soon after I called on friends in the business in other places, and found many of them complaining of the same troubles.

The trouble was a whitish mistiness that degraded the purity of tint and the surface quality of the print, so that, instead of a brilliant surface-colour, which should have been produced, the picture appeared sunk into the body of the collodion film and covered with haze, having something the appearance caused by excess of ammonia on an ammonio-nitrate print, or the same print very much over-toned.

This appearance was as plainly seen before as after toning, and was evidently caused by some defect of the collodion. I tried the addition of various reagents and organic compounds with some success, but soon became convinced that the theory which regards collodio-chloride as being simply chloride of silver suspended in collodion was erroneous, and that it was in reality a compound of chloride of silver and collodion, of such a nature that the chloride of silver was held in a peculiar state of solution instead of suspension.

My attention was first directed toward this view by noticing that all samples of collodion that produced the best prints had a humular opalescent look, and but little colour by reflected

light, and in small vials appeared transparent and of an orange or red colour by transmitted light, even when containing two or three times the quantity of chloride of silver contained in other samples which were opaque. This I thought could not be the case if the chloride was simply in suspension; and as I noticed that all the inferior kinds in my possession were quite white, creamy, and opaque, I determined to test the matter by a few experiments.

First. I precipitated a quantity of chloride of silver in a solution containing an excess of nitrate, in order to leave the chloride as sensitive to light as possible; then, after decanting the liquid, drained and washed the chloride in pure alcohol to remove the water; after this the requisite quantity of collodion, containing 2 or 3 grains to the ounce of nitrate of silver, was poured upon it in a bottle of sufficient capacity to allow of its being violently agitated by shaking. After being sufficiently shaken the citric acid was added. This collodion now exactly resembled in appearance that which I had received from New York, and which was so satisfactory; being thick, white, creamy, and opaque, the chloride did not subside on standing. I found prints made with this collodion to be, as I expected, milky, hazy, and feeble. I tried various proportions of free nitrate without producing much effect, and concluded finally that chloride of silver suspended in collodion was worthless for printing purposes.

Reasoning on the view that collodio-chloride was a definite compound of chloride of silver with some constituent of collodion, I thought success might probably be best attained when all the constituents were in perfect solution in collodion, and mixed suddenly at a low temperature; accordingly, I took a given quantity of plain collodion and divided it into three unequal portions: in the first and largest I dissolved sufficient nitrate of silver to make a strength of 8 grains to the ounce of the whole; in the next largest I dissolved chloride of strontia sufficient for about $2\frac{1}{2}$ grains to the ounce of the whole quantity of collodion, and enough citric acid to make about 1 grain to the ounce in the third and smallest portion. After shaking and standing until each was completely dissolved, I cooled them to below 60° Fahr., then poured carefully that containing the chloride down the side of the bottle upon that containing the silver, being careful not to mix them until the whole quantity was in the bottle, when, by shaking suddenly, they were mixed almost instantaneously. The citric acid was added in the same way. This collodion was almost colourless, having only a slightly milky and opalescent appearance, and this was chiefly caused by the reaction of the citric acid, before the addition of which the collodion was nearly as transparent as that containing only nitrate of silver, which always communicates a peculiar and characteristic appearance to plain collodion.

On making prints with this collodion I found it very sensitive, giving a remarkably brilliant surface-colour, but requiring a longer exposure to produce bronzing than other kinds in my possession, this fact being due to the very small excess of nitrate of silver. In subsequent experiments I found that increasing the excess of nitrate increased the intensity of the print up to a certain point, but that past this point the collodion rapidly deteriorated; and also that as the intensity increased the surface-brilliance was apt to diminish. The point of greatest intensity was usually reached when the collodion contained 2 or 3 grains of silver to the ounce in excess, being varied somewhat by the absolute amount of the whole; I found also that the keeping quality varied in proportion to the excess of silver—that containing most silver soon changing to an opaque white, and making hazy and feeble prints, particularly if kept in a warm place. Chloride of strontia was objectionable on account of its tendency to form crystals in the collodion at a low temperature, although previously completely dissolved—that is, before mixing with that containing silver; chloride of calcium is not liable to this objection; I did not test them in other respects. This matter of solubility in alcohol is one of considerable importance in the manufacture of collodio-chloride; if each ingredient is not in perfect solution at the time of mixing, not only loss ensues, but the result will be irregular and uncertain. I next tried the effect of different salts of silver. I made a compound salt by acting on fulminating silver with a mixture of the nitrates of silver and ammonia; the salt thus formed resembled ammonio-nitrate in many respects; it crystallized readily, in long needles; I have frequently found them 2 or 3 inches in length, and dissolved so freely in warm alcohol as to form a solid mass on cooling, but different from ammonio-nitrate in one very important respect; for while ammonio-

* *Humphrey's Journal*.

† The use of our collodio-chloride process is much more extended in the United States than in this country. Opal pictures there form an important element in the professional practice of portraiture.—Ed.

nitrate added to collodio-chloride causes it to turn to a dark-grey colour in a short time, I have collodion made with this salt which has been kept over two years, and is now as white as when new, and has changed less in other respects than common collodion would have done in as many months.

The prints made on this collodion were of a warmer tone than ordinary, being a bright-red instead of blue; they also lost less of intensity in toning; they had also a more brilliant surface-colour, with a large excess of nitrate of silver; and, on the whole, I preferred this collodion to any other.

Fulminating silver, which is a compound of silver and nitrogen, should not be confounded with fulminate of silver, which is a compound with fulminic acid. The former is sometimes formed in small quantities in the manufacture of ammonia-nitrate. I have known the cotton filter which had been used for ammonia-nitrate to explode on being disturbed after getting dry, and set fire to the contents of the waste-box. It is an exceedingly dangerous compound, being apt to explode if handled while wet, and almost certain to explode with fatal violence as soon as dry, resembling somewhat the iodide of nitrogen.

Some years since I was suddenly awakened about midnight by a loud explosion. On rushing into an adjoining apartment I found that a quantity of iodide of nitrogen, which had been reposing quietly for some weeks at the bottom of a small glass jar or bottle covered with water, had suddenly vacated its previous quarters, and taken up a position on the ceiling overhead, where it covered a space of ten or twelve feet, more or less. An incessant series of small but deafening explosions, seeming to testify to both rage and satisfaction, occurred as fast as the porous plaster absorbed the moisture; the room was filled with dense vapours of iodine, so as to render it almost impossible to breathe, or even see. Fortunately, I had a quantity of hyposulphite at hand, which was soon in a basin of water; a towel saturated and applied soon brought the enemy to terms before any more serious consequences ensued. Many other compounds of nitrogen are similarly or even more dangerous—the chlorido and the compound with gold, for instance—and had better be avoided. On this account I prepared a different salt, which answered the purpose nearly as well, although collodion containing it would not keep so long as the other. The mode of operation, as nearly as I recollect, was as follows:—

Into about two drachms of the strongest aqua-ammonia I dropped carefully small crystals of nitrate of silver until the liquid became muddy; then a few grains of nitrate of ammonia, or a drop or two of nitric acid was added until it became clear again; nitrate of silver was then dropped in again, until the liquid was saturated at a temperature of about 180° or 200°; about an ounce of alcohol was then added and heated rapidly to the boiling point; during which time the clear solution should pass through various shades of brown and red, until finally nearly black; on cooling, a light flocculent black deposit should subside, leaving the solution colourless, and of sufficient strength to crystallize in a solid mass below 60°.

A few drops of this solution added to ordinary collodio-chloride changes the colour of the print, giving more brilliant surface qualities, and preventing the milky haziness even when the excess of silver is considerable.

Care should be taken not to over-print too much, as the print does not bleach as much in toning as is usual.

Poor collodion may even be restored to tolerably good working qualities by means of this solution.

I have even made prints of the colour of carbon prints, and which required only fixing without toning, by a modification of the above process; but as I do not consider that as of any particular practical value, I shall not describe it at present.

Proceedings of Societies.

FRENCH PHOTOGRAPHIC SOCIETY.

The last Monthly Meeting of the Society was held on the 3rd ult., M. BALARD, President, in the chair.

M. FRANK DE VILLECHOLES submitted, in the name of M. Chambay, samples of unglazed photographic paper suitable for enlargements and also for ordinary work. The material, which

is twice as rapid in its action as albuminized paper, has received no glazing or coating of any description, but owes its particular qualities to the employment in the pulp of a mixture of certain ingredients introduced therein; the surface presented being rough in character, the operations of retouching and colouring are easily performed. It is sensitized with a 15 per cent. solution of nitrate of silver, of which half is first treated with ammonia until the precipitate has completely dissolved, and then added to the remainder, which is slightly acidulated with nitric acid.

M. SOULIER exhibited a large number of carbon prints which had been prepared by what he regarded as a modification, or rather simplification, of Swan's process.* A glass plate was coated with a film of very thin collodion, and as soon as this had set a dilute solution of gelatine was poured over it to form a second layer; on this was spread the sensitive compound upon which the photographic image was subsequently to be formed. When perfectly dry the whole is removed from the glass, and a homogeneous film of considerable rigidity is obtained, which may be manipulated with safety. The exposure takes place from the collodionized face, as in Swan's process, and the operation of washing is then proceeded with in the ordinary manner. No transfer of the print is requisite, but when properly developed it is mounted upon cardboard in the ordinary manner. M. Soulier likewise presented to the Society a negative taken instantaneously upon albumen, representing several steam boats on the Seine in motion.

M. BLANC made a few remarks in reference to the development of dry plates. He stated that it might be laid down as a general principle that the development of the lights of a picture is prejudicial to the development of the half tones, unless the lights have been somewhat over-exposed. It is for this reason that with two exposures of equal duration more detail is obtained in the shadows when the sun is obscured as when working with full sunlight, and that by alkaline development shorter exposure may be given than by the ordinary method; the silver which forms the image being at once decomposed, and unable, therefore, to exercise its affinity for the lights of the picture. For the same reason it is necessary to allow the lights of a picture to become solarized, so that their great affinity for reduced silver may be weakened, and also that a slow development is required for subjects presenting much contrast. With reference to slow development, M. Blanc communicated a method which he believed was not generally known. By placing a dry plate in a very dilute alcoholic solution of pyrogallie acid containing no nitrate of silver or alkali of any kind, an image may be gradually but very effectively developed.† It is very probable that the silver precipitated in this case is due to a trace of nitrate of silver still resident in the plate, which a washing of even the most careful description has failed to remove; decomposition taking place at once, the activity of the lights does not prejudice the development of the half tones, and hence a very gradual result, similar to that obtained by alkaline development. The mode of proceeding is a very slow one, four-and-twenty hours being scarcely sufficient for its completion; but what is lost in rapidity is gained in power, and it is in this direction M. Blanc thinks that photographers desirous of securing rapidity of action in dry plate photography should direct their attention, for the purpose of discovering some new developer. In chemistry the most feeble affinities produce great effects if the necessary time is allowed for their action; and what is the development of a negative but a chemical action? An exposure of the most rapid description suffices to secure a feeble impression, and to create, therefore, a feeble affinity for the reduced silver; by giving more time to the operation of development, varying its details, and employing new materials, the desired result might possibly be attained.

M. DE CONSTANT-DELESSERT forwarded a few copies, for distribution among the members, of his pamphlet on dry plate processes. He recommends therein the employment of the gum and coffee processes.

M. CIVIALE communicated a paper on the Employment of Sulphocyanides (see p. 223.)

M. DAVANNE brought under the attention of the Society

* It will be seen that this process, supposed to be a modification of Mr. Swan's, is simply that which Mr. Swan first described before the Photographic Society of London, and which is fully detailed in this specification.—*Ed. PHOTO. NEWS.*

† This is surely but another mode of applying the plain pyro developer of Mr. Mudd, or rather Mr. Wardley, well-known in this country, and practised for years.—*Ed. PHOTO. NEWS.*

some of M. Marion's new transparent pellicle, and described its uses.

M. DESPAQUIS described the process employed by himself for the preparation of carbon prints on *collodion-cuir*, and gave a practical demonstration of his method of developing and mounting the prints.

The Society thanked M. Despaquis for his communication, and requested him to prepare a description of the process for publication in the *Bulletin*.

The proceedings then terminated.

OLDHAM PHOTOGRAPHIC SOCIETY.

THE Ordinary Meeting of the above Society was held on Thursday, the 30th inst., the President, Mr. JOHN GREEN, in the chair.

After the minutes of the previous meeting had been read, Messrs. John Dalton and Wm. Fernley were elected members.

Mr. BEVERLEY then read a short paper on the Dry Plate Process, which will appear in our next.

There being no other business, the meeting was brought to a close.

Correspondence.

SEL CLEMENT.

DEAR SIR,—I presume you have taken the course of inserting the letter from "The Maker of the Sel Clement" merely as an act of courtesy to a foreign correspondent, who, although professing to be a chemical manufacturer, does not write like a chemist.

The writer says, "For me, substances containing carbon are not the only ones that are organic; but I consider as such all those which contain either hydrogen or nitrogen." Impossible! Has hydrochloric or nitric acid ever been included in the list of organic bodies? I challenge the writer to quote any authoritative statement to this effect. On the contrary, the existence of carbon is a *sine qua non*; without it no organic compound can be built up. Dr. A. W. Hofmann's apt definition of organic chemistry declares it to be "the branch of science which treats of the migration of carbon."

Again, it is suggested that "the nitrous fumes formed during the combustion have reduced the nascent carbonic acid into carbonic oxide, they themselves being converted into nitric acid." This view is quite opposed to well-ascertained facts: simply because nitric acid vapour, when heated in a combustion tube, splits up into red nitrous acid and free oxygen; and, in the presence of this latter, it is impossible for a *reducing* action to be exerted upon the carbonic acid. Your Paris correspondent takes exception to the form of apparatus used in my experiment, and asserts that it "was not properly arranged to show any trace of carbon;" whereas I took especial pains to prove the fact that it did furnish evidence of carbon when I purposely introduced a trace of sugar, after the Sel Clement alone had failed to show any indication of the existence of an organic component by the production of a white precipitate in the lime water.

The occurrence of nitrate of magnesia and of a large amount of water, as essential ingredients of the "Sel Clement, or Preservative Nitrate of Silver," is virtually conceded.—I am, dear sir, yours, &c.,

THE ANALYST.

May 1st, 1868.

THE PANORAMIC STEREOSCOPE.

DEAR SIR,—While thanking you for the kind notice in your Journal of the panoramic stereoscope, we shall feel much obliged if you will permit us to correct an error as to the assumption on which the new form is based. This you state to be that "the angle of natural vision horizontally is only one half of the vertical angle." We did not intend to convey that impression. What we really meant was, that while the size of two pictures which can be united stereoscopically is limited in the horizontal direction by the fact that their centres must be as nearly as possible opposite the pupils of the eyes, in the vertical direction it is limited only by the angle of natural vision, which practically admits of the use of a picture nearly double

the height of the width between the eyes. Our aim has been to modify the mode of taking and the instrument for viewing stereographs so as to take advantage of this fact.—We remain, yours, &c.,

W. HARDING WARNER.

London, May 5th, 1868.

ROBERT MURRAY.

[We have pleasure in giving insertion to the above explanation; but we must point out to our correspondents that the sentence to which they take exception is not ours, but theirs, or that of Mr. Warner, as in making an allusion to such a claim we felt it right to do it in the words of the claimant. The description of the instrument now before us, in Mr. Warner's handwriting, runs thus:—"The inventors have discovered and taken advantage of a new and important feature in optics hitherto overlooked by all makers of stereoscopes, viz., that the angle of vision horizontally is only one half of that vertically." Whilst fully recognizing the practical value of the new instrument for many purposes, and the satisfactory results it gave, we felt it a duty to take exception to what appeared an erroneous statement of principle as the basis of an excellent invention.—Ed.]

MODIFIED HONEY PROCESS.

SIR,—Thanking your correspondent, Mr. G. Robert Fitt, for his description of a "Modified Honey Process," published in the NEWS of 24th April, 1868, I should feel very much obliged if he would give the quantities of honey and water respectively to form the syrup, also the proportion of pure animal charcoal required, and whether the plates will keep some hours after exposure before development without injury, and if they should be flooded with water, or what, before development.—I am, sir, truly yours,

M. N. L.

57A, Wimpole Street, May 5th, 1868.

PHOTO-LITHOGRAPHY.

SIR,—We feel very reluctant to encroach upon the space of a journal devoted to science only, with reference to personal affairs, but we cannot permit statements to be made which, if circulated, may find believers among those who are perfectly uninitiated in photo-lithography.

In your number of April 24th, 1868, you made some remarks as regards the working of a "new process of photographing on stone;" and although you find the results excellent, and the application of photography most legitimate, yet you consider these results not to be examples of photo-lithography "as popularly understood."

You further speak of the results "on good authority," that the prints are the productions of a "silver process on a finely-grained stone, and the image is then worked with lithographic chalk," &c. But the "good authority" goes even beyond this in his observations, by stating before the Photographic Society that, "if he is not mistaken, the prints he has seen lately from a new process of photographing on stone" have been produced in the way described by you under the head "Griggs' Lithographic Process," and in which he states he obtained by the same means that he employed some four years ago; viz., by coating a grained stone with silver.

We do not know of any other house in England or on the Continent engaged at present in working commercially "portraits by photo-lithography," therefore we are compelled to come forward as the owners of the "new process of photographing on stone," for the purpose of answering and contradicting those statements.

An apprentice in lithography will be in a position to explain as to what the effects of lithographic chalk may be when being put upon a silver surface, or, indeed, any other surface but the cleanest surface of the stone itself.

We are fully alive as to the motives which prompted those statements, and therefore will confine ourselves simply to the declaration that our productions are the results of photographing direct on the stone with materials capable of yielding proofs in printers' ink only. We are not quite blind to the hints of your "authority" that he does not keep back useful information "selfishly," nor do we mind his allusions that he does not pride himself on "secret dodges," nor do we care for his pointed invitation to come forward and "give up freely the results of our labours." Nothing will induce us, beyond this letter, to be drawn into a controversy, for many and "obvious reasons." Suffice it to say that the means for obtaining lithographs by a

silver process "four years ago," or to-day, are not the only absurd experiments which have proved failures in the hands of your "authority."—We are, sir, yours respectfully,
29th April, 1868.

DIMSDALE AND CO.

[We are glad to have the assurance of Messrs. Dimsdale and Co. that the excellent portraits they have recently issued are by a process of photo-lithography properly so called. The allusions to "motives," of which they are well aware, to our "authority"—of whom, by the way, they can know nothing—&c., are entirely beyond our comprehension; we have not the slightest idea of what they mean; but as our correspondents seem to think them necessary to their explanation, and they may have a meaning for some persons, we give them insertion, repeating that the points in the letter which are clear to us—namely, the assertion of the truly photographic character of their excellent portraits—can give us and photographers generally nothing but satisfaction.—Ed.]

PHOTO-LITHOGRAPHY.

SIR,—As I am wishful to make some experiments in photo-lithography, will you oblige me with answers to one or two questions?

1. Is there any special advantage, besides the convenience of working, in the mode of producing an image on paper to be transferred to stone, instead of working directly on stone as in some of the earlier processes?

2. I see in a contemporary an intimation that as the object of treating a transfer with water is to swell the unaltered gelatine, cold water is necessarily the proper thing to apply, and not hot, and expressing surprise that the members of the Photographic Society present when Mr. Griggs read his paper showed such ignorance on the subject. I wish to ask if the object of applying water is to swell the gelatine, and, if so, for what purpose? I have always understood that the object was to remove the gelatine, not to swell it.

3. Is photo-lithography generally, or any part of it, protected by patent, or is it open to the public to practise without licence or patent rights having to be gained? If not, which process is free to the public?—Yours, &c., X.

[The advantages of the transfer process, besides convenience in working, consists in getting a greasy image direct on the stone. In most processes in which the picture is produced by working on the stone, the image is formed on the stone in some such substance as gelatine and bichromate, or bitumen, and thus it quickly wears out. 2. We fear it is the writer in question, and not any member who spoke at the meeting, who betrays want of familiarity with the operations of photo-lithography. If the object had been to swell up the gelatine, most folks know well enough that cold water would effect it best. But the object is not to swell up the unaltered gelatine; where hot water is used, the object is to dissolve the gelatine and remove it entirely. Where cold water is used, or rather slightly warmed water, as in Mr. Griggs' case, the object is not to remove all the gelatine, but only just such a surface as will effectually take away the ink except on the parts made insoluble by light. If the soluble gelatine were swelled to any appreciable extent it would interfere injuriously with the operation of transferring, by bearing off the unswollen inked lines from contact with the stone. 3. There are several patents for photo-lithographic processes; but the general features of all processes are open to the use of the general public without restriction.—Ed.]

SOURCES OF SUCCESS IN OPERATING.

DEAR SIR.—Mr. McLachlan's remarks in your number of the 17th January are, if practical, extremely interesting to photography. It has always been an art in which much was obscured; there is no rule, so to speak, on which to work with success; suggestion after suggestion is made in your Journal; one upholds *this* to be correct, the other flatly denies it, and states *that* to be the proper way, and so on. But Mr. McLachlan steps out of the usual course, and challenges the public to produce by himself, *consequently*, a certain amount of pictures, and free from every blemish, with *success*! Every photographer knows it is possible, but in his experience has it ever happened that he could say the same? Consider, the number is large, and the amount of silver used is wonderfully small in proportion (see his letter, p. 400: 7 by 4 negatives with 2 ounces of silver,

and still plenty to spare). I shall be glad to see you comment upon it.

By the way, I was rather amused at the persistency of that idea argued about converting bad negatives into good ones, touching the negatives, &c.: not mere spots, but painting over it at a wholesale rate. Why not rather study your photo-rooms, look more to your light, your chemicals, than to producing artificial effects? I was very much pleased with Mr. Johnson's paper on "Natural Clouds in Landscape Photography." What further proof would you require in reading his account of Mr. Braun's pictures? As pictures they are perfect; as a commercial speculation they have paid handsomely. Another fault is often committed by using the argument that "the public won't have it so." In how many various ways does one hear that expression? It is to some degree true; doubtless a large portion of the public do not care much about the delicate and beautiful—or, perhaps, I might put it, they prefer the excessive contrast to the fine gradation—but it is not wholly to them the photographer looks for his earnings. Moreover, if he were to produce superior pictures, the mind of the public would, in like manner, be educated up to them, and they would in time be appreciated. Mr. Johnson's letter is upon clouds; it will apply to nearly every species of photography. A good photographer will turn out a good picture at the same place and time in which an inferior one will produce a wretched caricature.

A grand discussion has been carried on in your pages with regard to the photographs in the late exhibition, more especially to those of M. Adam-Salomon, which I should much like to see. From what I can glean, the lighting is thought to be the chief source of success. Whilst lighting undoubtedly has a great deal to do with it, I agree with "Ennel," that it is *judgment* which is most required. You mentioned some time ago some photographs exhibited which had an extremely picturesque and pleasing effect, yet these had all the lighting from *behind*, viz., the person taken thrown in relief. I do not remember ever having seen any such, but your remark says at once that it is not the *material*, but the way in which light is applied, which is conducive to success; i.e., your light may be north, south, east, or west; study the effect of each, and you will find each has its good effect; and, after all, it is the picturesque that is called for. To produce a portrait with every feature distinctly marked, every fold in the clothes sharply and softly defined, is good, but it is not everything. If one photographer (and there are some) can get that requisite, surely it is within the power of another to do it; the requirement is to make the best of what you have. I take it, in Mr. McLachlan's case, a knowledge of chemistry is indispensable. I shall look forward with eagerness to see more upon the subject.—Yours truly,

CEYLON.

Columbo, Ceylon. March 24th, 1868.

[As you will see, Mr. McLachlan has already made a partial statement, and will make a more perfect one shortly.—Ed.]

Talk in the Studio.

SUGAR IN THE PRINTING BATH.—The Paris correspondent of a contemporary, giving a notice of M. Davanne's *Annuaire*, says that he "has a rap at Mr. Bovey" for having proposed "a little sugar in the nitrate bath." M. Davanne is represented as condemning the indefiniteness of the quantity described as "a little," and as failing to see how an organic substance having the power to reduce silver can preserve the whiteness of the sensitive paper. Somebody has blundered a little here. Mr. Bovey did not propose "a little" sugar, but, finding such a proposal made by an American photographer, he tried it, and gave photographers the benefit of his experience in the form of a definite formula, the value of which has been verified in his own practice and that of many photographers since. The paradox of a reducing substance having a preservative action was pointed out and discussed, with its probable solution, in our pages six months ago, when Mr. Bovey's recommendation to use sugar was first published.

COLOURED NITRATE BATH TO PREVENT "BLURRING."—Mr. Carey Lea proposes to prevent blurring from the light reflected by the back of the sensitive plate, by using a nitrate bath containing a neutral colouring substance, which makes the solution blood-red. The colour is washed away in the sub-

sequent operations, without further affecting the negative. Mr. Lea's article is compelled to stand over this week, but will appear in our next.

OBITUARY.—M. Hermagis, a photographic optician, whose lenses are well-known, died a week or two ago in Paris.

LIGHT AND COLOUR.—Here is a fact showing the influence of artificial light in the production of green colouring-matter. Some lilacs were placed for forcing in a heated cellar partially lighted with gas. Those leaves that were exposed to the light became green, as if they had been in the open air, while the remainder were etiolated. The fact is recorded by M. Ermins in a recent number of the *Revue Horticole*.—*Land and Water*.

THE ROYAL DIARY.—Messrs. Marion and Co. have just issued a series of landscape photographs to illustrate the Queen's book, "Leaves from the Journal of our Life in the Highlands." They are forty-two in number, and are so mounted that they may be bound with the original edition of the book they are intended to illustrate.

THE AMERICAN PHOTOGRAPHIC CONVENTION.—A very full report of the proceedings of the Convention of Photographers in the United States appears as a supplement to the *Philadelphia Photographer*, in which it fills thirty-two columns. Of these, 3,500 copies were ordered to be distributed amongst the photographers of the United States.

USE OF MONOCHROMATIC LIGHT AS A MEANS OF DETECTING DISEASE.—Photographers, says the *Scientific Review*, and other persons accustomed to make use of various kinds of light, have often alluded to the curious properties of monochromatic rays; i.e., rays of one colour. Thus, a spirit lamp burning alcohol saturated with common salt gives a ghastly hue to the features of the bystanders. We read in a recent paper by a Dutch physician, Dr. G. Schlegel, that this property has been made use of in China for many years as a means of distinguishing persons affected with leprosy. The virus can be thus detected in the blood of a person who has been infected with this dreadful disease only one or two days. By ordinary daylight it is impossible, at this early period, to remark any difference between the tint of his skin and that of a person in perfect health; but when the faces of both are lighted up by the flame of a spirit-lamp saturated with salt, whilst the face of the healthy person appears deadly pale, that of the individual affected with leprosy appears red as fire. It would be interesting to ascertain whether monochromatic light could be used in the same manner as a means of recognising any of our European diseases.

To Correspondents.

A. E. C.—We first described our method of intensifying with permanganate of potash in the article published two or three weeks ago. It simply consists in immersing the fixed and washed negative in a weak solution of permanganate of potash; strength not important. We have used from 5 to 10 grains per ounce. Condyl's fluid, diluted with two or three times its bulk of water, will answer. 2. The exact strength of a dilute solution of anything depends upon circumstances; from 5 to 10 grains per ounce may be used of sulphide of potassium. In what have you failed in using this substance as an intensifier? It is probable that "collodium" is simply a misprint for collodion.

W. J. A. G.—We have generally used a hot alkaline solution for removing varnished films. A hot solution of caustic potash will answer well; but the plates should not remain long in it, but be quickly washed thoroughly with clean water, and dried. You will find a method described in our number for April 9th, p. 179. 2. Either a green or a dark blue curtain may be used for pictures without disadvantage. 3. The way we should proceed with a print which had stuck to the varnish of a negative would be to lay a piece of damp paper on the print until it was thoroughly permeated with moisture, and then endeavour to lift it away. If a thin film of the albumen or paper remained attached to the varnish, which in many cases it might, we should remove it with moisture and gentle friction. We are glad the stereoscopic question became clear to you.

M. Row.—The majority of the pictures are very good indeed, and show satisfactory progress. The lighting is, in most cases, good. The best poses are the group of two girls, the reading young lady, and the vignette of a lady in black silk dress. The experiments in forcible effects in lighting are good. 2. The statement that the toning bath made with carbonate of soda and gold should not be used again simply means that, as a rule, the

bath so made becomes inert after being made a few hours. There is no harm in using it as long as it will tone the prints. 3. The gelatino-iron developer is excellent under many circumstances. The question of the wisdom of using organic additions to the developer depends upon circumstances. With some modes of lighting there is a tendency to weak images, in which case the organic addition is an advantage; in others, there is a tendency to excess of vigour, and then organic additions will be avoided. The formula of Mr. Hughes is one of the best for a gelatino-iron developer.

H. S.—We will examine the deposit, and report in our next. 2. We cannot refer you to any information on the subject, except what has appeared from time to time in our pages. See article in the present number.

ALBUMEN.—The yellow spots in the prints are spots of imperfect fixation,—how caused we cannot with certainty say; probably from air-bubbles forming on the prints whilst in the fixing bath, and so causing imperfect action of the solution.

MAGNESIUM (India).—Comparatively little experience is on record as yet as to the use of the magnesium light for photographing dark interiors. Mr. Waldeck's account of his operations in photographing the Mammoth Cave at Kentucky furnishes the best hints. You will find it in our Tenth Volume, p. 567. Several lamps were used there, and these were arranged so as to give a dominant light from one direction, with a minor light arranged so as to illumine slightly the deep shadows left by the chief lights. Unless the interior be very small, one lamp would scarcely be sufficient.

F. M. YOUNG.—We returned the prints by post, numbered in the order of superiority of tone. None of them were, however, quite the tone we prefer, and which we have obtained by means of the sulphocyanide toning bath. Probably the negatives are not very vigorous, which may account for a slight lack of brilliancy in the prints. The two pale prints, which you suppose probably had no gold, had in reality, we think, a large proportion, but being deposited slowly upon somewhat feeble images, they acquired the pink or mauve tint which deposits of gold do assume on some occasions. That the sulphocyanide toning bath is a somewhat expensive one is, we think, correct, as a large proportion of gold is consumed in using it.

H. WORTH.—We are glad that the matter was satisfactorily solved.

R. B.—You will find several articles describing the operation of enamelling photographs with gelatine in our Eighth Volume, and also in our YEAR-BOOK for 1865.

G. FULLAR.—We have no doubt that the nitrate of silver to which you refer will answer very well for a negative bath. 2. We have no reason to believe that any process vendes as you describe will contain a secret worth the money, but of course we cannot with certainty say whether it is worth the money or not. You will find an article in the present number on the subject. 3. The fault of the print appears to arise from a defective piece of paper, but we cannot say the cause of the defect. 4. We believe that the lens you name is worth its price, and we should select it for the purpose.

R. M.—The report to which you refer was full of mistakes, misstatement, and misrepresentation, but was not of sufficient importance for notice.

L. D. F.—The collodion appears to have been unsuitable for transferring; much of success depends upon the use of a tough collodion of good body. See article in the present number. Your tone is capital.

B. A. G.—You do not describe the toning bath you use; we cannot, therefore, tell you the reason of the bleaching. You state that the bleaching took place after adding chalk to it. If the prints are immersed in a toning bath immediately after making or neutralizing, bleaching will generally take place. Are you sure that you did not leave considerable excess of acid in the chloride of gold you made? 2. The nitrate of copper may be got rid of by fusing the nitrate of silver, and maintaining the heat sufficiently high to decompose the copper salt; but we do not think the presence of a little nitrate of copper at all injurious. 3. The orthoscopic lens is correctly arranged.

ERRATUM.—A printer's error occurs in the last line but one of "Echoes of the Month" in our last. For "matters not within their control," read "matters more within their control."

Photographs Registered.

Mr. W. W. LAW, Northampton,
Two Photographs of Westminster Abbey.
One Photograph of Westminster Palace.
One Photograph of Waltham Abbey.

Mr. F. DOWNER, Watford,
Photograph of Grove Mill Lane, near Watford.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
A Modification in Transferring Carbon and other Tissues.....	229
Mr. McLachlan's Discovery.....	229
Collodion Negatives without Glass.....	230
Iron Development for Gum Plates. By Russell Manners Gordon.....	230
Pictorial Effect in Photography. By H. P. Robinson.....	230
Copyright and Piracy.....	231
On Some of the Changes which take Place in Photographic Materials and Chemicals after a Lengthened Disuse. By John Bockett.....	233

	PAGE
Redevelopment by Nitrate of Silver and Citric Acid. By John C. Browne.....	234
On Blurring, with a New Remedy. By M. Carey Lea.....	234
Mr. Chance's Lecture on the Manufacture of Glass.....	236
Proceedings of Societies—North London Photographic Association—London Photographic Society—Liverpool Amateur Photographic Association.....	236
Correspondence—Photo-lithography—Modified Honey Process.....	239
Talk in the Studio.....	239
To Correspondents.....	240

A MODIFICATION IN TRANSFERRING CARBON AND OTHER TISSUES.

WE have recently had our attention called by Mr. William Firling, an ingenious and persevering amateur of Dorchester, to a valuable modification he has made in the mode of transferring the film containing the image in producing photo-enamels, carbon prints, &c., at once eliminating several difficulties, and securing ease, simplicity, and certainty in the operation.

In M. Joubert's, or any similar enamel process, in which a film of collodion is used to transport the layer of vitreous colour and organic matter, which form the picture, from the flat glass upon which it was originally produced to the surface upon which it has to be burnt, one of the difficulties consists in getting rid of the collodion before burning. It is often found to resist the solvent action of ether and alcohol, remaining obstinately insoluble. Mr. Firling's method gets rid of all difficulty on this score. In his method of enamelling he prepares a tissue resembling carbon tissue, but containing vitreous colours instead of Indian ink or lampblack. This is exposed under a negative, as in carbon printing, with the prepared side in contact with the negative. After exposure the prepared side is coated with a solution of bees'-wax in turpentine, one ounce of the former in three of the latter. When this is dry it is coated with collodion, and then the tissue is placed in warm water and developed in the same manner as a carbon print. When this is done it is placed upon the enamel tablet, or other surface upon which it is intended to be burnt, to which it is made to adhere by means of gelatine. The elasticity of the collodion allows it to be adapted to convex or concave surfaces without wrinkles, and when it is dry it is only necessary to get rid of the collodion to make the picture ready for firing. The tablet is slightly warmed, which softens the wax between the collodion and the image, and on lifting the edge of the collodion film it can be removed without the slightest trouble, bringing with it the coating of wax, and leaving only the image on the tablet.

Mr. Firling adopts a similar plan in carbon printing. After exposing the carbon tissue it is treated with the solution of wax before mounting on the paper with caoutchouc for the purpose of developing. The various manipulations having been completed, and the developed image mounted on its final resting place, instead of sponging the caoutchouc-coated paper with benzole to soften the india-rubber, the mounted print is very slightly warmed, which permits the paper upon which it was developed to be removed at once, taking the wax with it, and leaving the print perfectly clean.

Some examples of photo-enamels and of carbon prints transferred to ground glass and to opal glass, which Mr.

Firling showed us, illustrated the value of this mode of working, the results being in all cases excellent, and the operation, as Mr. Firling assured us, simple and certain.

MR. McLACHLAN'S DISCOVERY.

MR. McLACHLAN's written and detailed account of his mode of working, brought before the Photographic Society on Tuesday night, does not differ in any material degree from the hasty verbal statement made at the former meeting. After listening carefully to his fullest explanation, we repeat the statement we made a month ago: *assuming the facts to be true, and holding him responsible for their truth*, the communication he has made is a most important, as well as a most extraordinary one. The facts, however, are not easy to verify, as he now states that for a fair trial of the experiment the silver solution must be exposed to sunlight for three months of the most actinic season of the year. As for the only attempts at verification hitherto made, those of Mr. Spiller, they scarcely support the statement made by Mr. McLachlan, who, however, objects both to the experiments and the account of them.

Until we publish the paper in our next it would be obviously unfair to the reader to enter into more detailed comment than we have already made upon his proposed mode of operations. As, however, we give Mr. McLachlan credit for perfect honesty as well as great enthusiasm, we shall not hesitate to comment with equal honesty upon his statements. The especial end he desires is investigation. Experimental investigation will require, he says, three months; examination of the nature of his claims may be made at once. Mr. McLachlan has a right to expect that this shall be done in a fair and courteous spirit, without the ready jibe—so ready on some lips—and the "mockery which is the fume of little hearts." Candid and courteous criticism is the compliment fairly earned by the outspoken liberality with which Mr. McLachlan has made his communication, and in our next we shall have a few remarks to make on the assumptions on which his paper is based.

It is only necessary at present to correct an error in our statement of Mr. McLachlan's formula a month ago. We then stated that to 16 ounces of a 12-grain iron solution $3\frac{1}{2}$ ounces of acetic acid were added; and this led to the idea in the minds of some that the neutral or alkaline conditions of bath and collodion were corrected by the use of excess of acid in the developer. Mr. McLachlan, in giving his verbal statement of formula at the meeting, said $3\frac{1}{2}$ drachms of acetic acid were added; but in a subsequent conversation, in which we asked him to verify the short-hand notes of his remarks, he gave the formula as $3\frac{1}{2}$ ounces, which was incorrect, and, as he now states, must have been a *lapsus lingue* in the excitement of the moment. As experiment

with the developer is impossible until after the lapse of the months necessary to prepare a bath, no inconvenience can have arisen from the error.

COLLODION NEGATIVES WITHOUT GLASS.

In a recent notice of M. Marion's transparent tissue we referred to Mr. Woodbury's experiments in a similar direction, with a view to provide a light support for dry collodion negatives. We have recently received from him some interesting results illustrating the extent to which he has already worked his project out. These consist of negatives on a support of tough, transparent, flexible collodion, and sensitive plates ready for exposure on a similar support. The support is not too thin to permit easy and safe manipulation with the negatives, or to risk cockling or forming creases; but is, nevertheless, sufficiently thin to permit either side of the negative to be placed in contact with a sensitive surface without loss of sharpness.

The mode of preparing the dry-plate films is very simple. It consists in applying to a plate of glass a coating of castor oil collodion; when this is dry, applying a very dilute solution of india-rubber to protect the first collodion film from being dissolved, when a second is applied. The second coating of collodion is a sample suitable for the dry plate required. This is applied on the india-rubber coating, and excited, washed, treated with a preservative, &c., in the manner usual with the dry process which may be selected. When the prepared film is dry it is cut round the edges, lifted from the plate, and stored in the dark for subsequent use. It will be seen that it will be easy to prepare such sensitive films in large sheets, which may be cut up subsequently to any size which may be required. We believe that Mr. Woodbury contemplates the commercial preparation of such sensitive films; but he has promised, in any case, to supply more precise details of his operations for the benefit of our readers.

IRON DEVELOPMENT FOR GUM PLATES.*

BY RUSSELL MANNERS GORDON.

As some of your readers may perhaps be working gum plates, I recommend them, in preference to an alkaline developer, the following iron one:—

Gelatine	...	...	...	1 grain
Acetic acid	...	...	...	15 minims
Iron	...	...	...	20 to 30 grains
Water	...	...	...	1 ounce.

It is perhaps a good plan to dissolve the gelatine in the acid and a part of the water, and the iron in remaining portion, adding them together after complete solution. A gentle heat may be necessary to get the gelatine to dissolve.

After wetting the plate previous to the development (with distilled water), take as much of the above iron solution as may be found necessary to cover it; and add to each drachm one drop of a 30-grain solution of nitrate of silver. Add the silver to the iron *before* pouring it over the film. The development is nearly as rapid as that of a wet plate.

After the details are out, a few more drops of silver may be added to the iron, and this, again and again, poured over the plate to complete the primary development.

When all is out, the necessary intensity may easily and quickly be obtained by the usual solution of—

Pyro...	...	...	...	2 grains
Citric	...	...	...	2 "
Water	...	...	...	1 ounce

And a few drops of the silver solution.

I do not approve of iron development for dry plates in general; but with these gum plates it seems to answer better than anything else.

* We have recently seen some of Mr. Gordon's negatives, which leave nothing to be desired in technical beauty. In point of sensitiveness, the plates equal, or exceed, any dry plates we know. We shall have more to say on the process in our next. —Ed.

The advantages in this way of working are:—

- 1st. Better adhesion of the film.
- 2nd. Much less blurring.
- 3rd. The appearance of the finished negative is very much like that of a good wet one; there is therefore no difficulty in judging of the correct amount of intensity.
- 4th. The exposure is, if anything, shorter than with alkaline pyro, &c.

It is curious that when using a gelatino-iron developer, the deposit of silver on the film is not removable by friction, while with an ordinary iron solution containing no gelatine it may be entirely rubbed off. And, again, although gelatine certainly necessitates a longer exposure in the wet process when used in the above quantity, it does not seem to do so in the least with these plates.

In preparing gum plates the gum and gallic acid might, of course, be mixed together before applying them to the film; but I found that a solution containing 20 grains of gum and 3 of gallic acid to the ounce of water darkened to the colour of brown sherry in about an hour, and I fancy that a white preservative is less likely to affect the exposure than one of so non-actinic a colour.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XVI.

"Another important means of expressing unity is to make some kind of sympathy among the different objects, and perhaps the pleasantest, because most surprising, kind of sympathy, is when one group imitates or repeats another; not in the way of balance or symmetry, but subordinately, like a far-away and broken echo of it."—*Ruskin*.

"As men are not to mistake the causes of these operations, so much less are they to mistake the fact or effect, and rashly to take that for done which is not done."—*Bacon's Natural History*.

"Unhappy man! to break the pious laws

Of nature

Howe'er the doubtful fact is understood."—*Dryden*.

"In things the fitness whereof is not of itself apparent, nor easy to be made sufficiently manifest unto all, the judgment of antiquity, concerning with that which is received, may induce them to think it not unfit."—*Hooker*.

VARIETY AND REPETITION (*continued*).—FITNESS.

This law of repetition will be found to pervade all great pictures, perhaps more notably in colour, but also, to a great extent, in the disposition of lines and light and shade. The repetition of incident is almost invaluable in telling a story, of which both Wilkie and Hogarth were great masters. In Wilkie's picture of the First Ear-ring, now in the gallery at South Kensington, in which a woman is performing an act more worthy a savage community than a civilized nation—that is, boring a hole in a child's ear, that jewellery may be hung in the flesh, under a mistaken notion of ornamentation—the action is repeated, or at least alluded to, by the spaniel on the ground scratching his ear with his paw; and in the first of the series of Hogarth's great pictorial epic now in the National Gallery, the Marriage à la Mode, the indifference of the intended bride and bridegroom, who turn their heads away from each other, is repeated in the two dogs at their feet, linked together, but of different minds. The way in which Hogarth made insignificant objects perform a double purpose, and help to tell the story, is simply wonderful. Instances must occur to all admirers of his works, and may be imitated by photographers. In Leslie's "Handbook" many instances are cited; the following, referring to two of the best known works, I quote:—"In the marriage scene in his 'Rake's Progress,' in which the hero, having dissipated his patrimony, appears at the altar with an ancient heiress, we are shown the interior of Old Marylebone Church, at that time standing in an out-of-the-way part of the suburbs, and, therefore, resorted to for stolen marriages, or marriages of which either of the parties had any reason to be ashamed. The church, a very small one, is in a neglected condition, and cracks in the walls, mildew, and cobwebs, would occur to an ordinary painter; but Hogarth has shown a fracture running through the table of the Commandments; the Creed

is defaced by damp; and he has placed a cobweb over the opening in the charity-box. Again, an empty phial, labelled "laudanum," lies at the feet of the expiring viscountess, in the last scene of the 'Marriage à la Mode;' but this was not enough,—he has placed close to it the "last dying speech of Councillor Silver-Tongue," suggesting that it was the death of her lover, and not her husband, that caused her to swallow poison."

Laws become hurtful when they are carried to excess, and repetition becomes caricature when observed so closely as to verge on mockery. There is a curious instance of this in one of Turner's etchings, reproduced by Ruskin, and commended in his "Elements of Drawing." In the foreground, standing on a bridge, are a man, a boy, and a dog; and in the distance, at the top of a hill, are a man, a boy, and a dog, the boy and dog in exactly the same position as in the foreground. This is an example of repetition and symmetry which should not be repeated, and with which it is impossible to sympathise. In the same book Ruskin mentions a picture by Vandyke, exhibited at Manchester, in 1857, representing three children in court dresses of rich black and red. The law of repetition was amusingly illustrated in the lower corner of the picture by the introduction of two crows, in a similar colour of court dress, having jet black feathers and bright red beaks.

The true end of variety is to give relief to the eye; repetition is harmony until it becomes monotony; then variety should step in to relieve the tired and perplexed attention. Deviation from uniformity in the outlines of nature gives greater zest to the pleasure arising from the contemplation of order and regularity. Alison, in his essay on "Taste," observes, "Beautiful forms must necessarily be composed both of uniformity and variety; and this union will be perfect when the proportion of uniformity does not encroach upon the beauty of embellishment, and the proportion of variety does not encroach upon the beauty of unity." Which sentence, properly understood, contains the essence of the art of composition.

Repetition is one of the principal elements of repose in art. No picture can be considered to have attained any approach to completeness that has not repose, and, for many reasons, it is still more necessary in photography than in any other means of representing nature. I am not certain that any perfect photograph—that is, one that has produced a perfect sense of completeness in the beholder—has ever been done which has not this quality to a very great extent. In the "Blind Fiddler," the expression and use of repose is perfect. The relief given by the happy serenity of the old man and the fiddler's wife and children is a very agreeable contrast to the action of the man snapping his fingers and the boy with his improvised musical instruments. I am aware that very exquisite large pictures of waves in motion have been published by Le Gray and others. I also know that Blanchard, Breese, Wilson, and one or two more, have attained very great success in representing moving objects in pictures for the stereoscope; but, even in its highest flights, art can only suggest motion, and those artists who try to represent it appear to me to be nearly guilty of a solecism. The pictorial representation of a moving mass depicts as immovable that which is in motion. The representation is therefore false. This is, perhaps, allowable in painting, where a certain license is not considered improper; but for the photographer to do so is entering upon doubtful ground, and requires grave consideration. To represent the result of motion would be legitimate. It is a rule in sculpture that the right moment for representation is that of *arrested* or *suspended* action. If photographers would also observe this rule it would save their works from the risk of any appearance of extravagance, or any suggestion that they represented a doubtful truth.

The last paragraph suggests that a word or two on what is fit to represent by our art may not be out of place here.

The proper adaptation of means to an end—or, in other words, "fitness"—is a great source of beauty. Not only is fitness the proper application of means, but—especially in our

art—the production must be a fit result of the means employed to produce it. Photographs of what it is evident to our senses cannot visibly exist should never be attempted. The absurdity of representing a group of cherubs floating in the air, for instance, is felt at once. It would be possible, by double printing, to make a very passable photograph of a centaur or a mermaid, but the photographer would discredit his art; he would not be believed, and would deserve to be set down amongst charlatans and Barnums. He would be worse than the great showman, who, to his credit, confessed himself a humbug, while the photographer would expect the world to believe his work to be a truth. I am far from saying that a photograph must be an actual, literal, and absolute *fact*; that would be to deny all I have written; but it must represent *truth*. Truth and fact are not only two words, but, in art at least, they represent two things. A fact is anything done, or that exists—a reality. Truth is *conformity* to fact or reality—absence of falsehood. So that truth in art may exist without an absolute observance of facts.

A great part of the emotion of beauty which we feel in regarding nearly all manufactured articles that aspire to this quality has its origin in fitness. Decorative beauty depends, in a great measure, on fitness, and the beauty of proportion is also to be ascribed to this cause. Objects which are disgusting in themselves may become beautiful to the eye which sees their usefulness or fitness. For instance, we hear the surgeon talk of a "beautiful preparation," or a beautiful instrument.

It is no fault in a photographer that his art will not carry him as far as paints and brushes do the painter. His productions would only be defective when he failed to do what was possible in his art—an art in some respects more difficult than that of the painter, because, like sculpture, more circumscribed and limited. The photographer must not let his invention tempt him to represent, by any trick, any scene that does not occur in nature; if he does, he does violence to his art, because it is known that his finished result represents some object or thing that has existed for a space of time before his camera. But any "dodge, trick, or conjuration" of any kind is open to the photographer's use, so that it belongs to his art, and is not false to nature. If the dodges, tricks, &c., lead the photographer astray, so much the worse for him; if they do not assist him to represent nature, he is not fit to use them. It is not the fault of the dodges, it is the fault of the bungler.

To conclude this subject, the painter may imagine new worlds, and interpret his imagination with his pencil; he may paint an embodiment of that which has not yet occurred, such as the last judgment, for example; he may represent angels and cherubim, and he does not commit a very great mistake, or at least one that has not already been condoned by artistic opinion. But, on the contrary, if the photographer, who could, if he had the skill, with the means at his disposal, follow very closely after the painter in representing his ideas of things unseen, attempts to do so, he holds his art up to ridicule and contempt; the reason being that he violates "fitness."

COPYRIGHT AND PIRACY.

[THE following article is from the pen of a gentleman whose experience in connection with the production and publication of engravings as well as photography entitles his opinion to much weight. We have always endeavoured, whilst giving the strongest condemnation to piracy, to deal fairly and honestly with both sides of the question. In doing this our contributor seems to think that we and some other portions of the press have scarcely done the print publishers justice. We willingly, therefore, give prominence to his views.—Ed.]

Although much has already been written on this subject, the question still remains apparently as obscure as ever. Not

a little of this unsatisfactory state of things is mainly attributable to the misdirection given, unintentionally, no doubt, by some of the writers who have attempted to clear the way without sufficiently studying the question at issue.

The first point to be determined seems to be whether that portion of any artistic property called "copyright" shall be set apart as being an exceptional kind of property, falling under an exceptional rule. A man may enjoy the undisturbed possession of any sort of property acquired legally, and for a legitimate purpose, but it appears that such is not to be expected in the case of the copyright works of art. The Act 25 and 26 Vic. has recognized a property in works of art, designated under the name of "Artistic Copyright," and has regulated the legal transmission of that property from the creator or owner of it into other hands, but it has hitherto utterly failed in securing to the purchaser of that particular property the lawful advantages he had a right to expect from his purchase. A publisher of books is willing to pay to a popular author a considerable sum of money for the right to publish the manuscript so acquired by means of the press, secured, as he thinks himself, by the existing laws against any infringement of his property; but, assuming for a moment that means were to be found to reprint a book as cheaply and as rapidly as an engraving can be reproduced by means of photography, could any one pretend to palliate the offence on the plea that such a book being only obtainable at a high price, it was scarcely wrong to endeavour to satisfy the demand of thousands of persons by placing within their reach a spurious copy of the original book made in defiance of the law, and circulated to the great detriment of the publisher?

The pretence of the generality of offenders, that they acted in ignorance, not being aware that the work they copied was "copyright," is totally inadmissible; it is a dishonest speculation, entered into deliberately, with the avowed object of securing a large trade with the many who would not purchase the original engraving on account of its high price, and who choose to shut their eyes to the fact that they are buying *stolen goods*. The very mode of circulating and disposing of those pirated copies is sufficiently suspicious to awake in the minds of honest people a notion that there is something wrong; they are not sold in open daylight, but, in general, are kept in a back part of the shop, and only brought out when the vendor thinks he can rely upon his customer; or else a hawker of these photographs comes into the office of a gentleman just at dusk, or near closing hours, and begins to exhibit other works before he produces these piracies, generally succeeding in persuading people to purchase, but never leaving his address, as a rule.

The "moral wrong" of which printsellers are accused in the article reprinted from a contemporary is simply ridiculous; and it is a novel idea that a tradesman is bound to carry on business for the advantage of others, and to his own detriment; that he ought to lay out large sums of money to procure enjoyment to thousands of the art-loving public, and take his chance of any remuneration as well as he can, not as he considers it safe to himself. It would, no doubt, be very desirable if the productions of our modern artists (for those are chiefly the subjects chosen for piracies) could be placed within reach of the many; and if a picture itself could give a good reproduction by means of photography, there might perhaps be found some artists willing to enter into combination with a photographer, as suggested by the article alluded to, with a view of publishing their works; but the practice has shown that, except in a very few cases, photographs executed direct from the picture were found to be very unsatisfactory, and the really fine photographs executed or circulated by the pirates are all done from excellent engravings which have cost a publisher large sums of money. This is a point of considerable importance in the discussion of the subject. When the time comes for a legitimate return of his outlay, in steps the photographic pirate, who perpetrates a double injury: firstly, on the publisher, who is fraudulently deprived of the profit to which he was entitled

by a cheap reproduction of the engraving circulated extensively in competition with the print; and also by robbing the engraver of the merit which attaches to a successful engraving, since his name does not appear in any way on the photograph copied from it. It is inconceivable that many enlightened writers—the editor of the *Athenæum* amongst others—should allow themselves to be carried away from the main point through the liberality of their minds; and the proverb, "We must be just before we are generous," might be applied to them.

The argument of the difficulty in ascertaining which are or are not copyright in works of art cannot be maintained, for no one can seriously pretend that a man picking up a purse containing money has a right to appropriate the contents to his own use under the plea that he does not know to whom it belongs, and does not choose to make inquiries. But in most, if not all, the piracy cases that have come before the Courts, the photographer must have known the name of the publisher whose property he was dealing with from the engraving itself, as it was engraved in the plate, as well as the address, and no possible excuse can exist in extenuation of the dishonesty practised.

Printsellers are also criticised upon their mode of conducting their business, and especially for selling an unlimited number of so-called proof impressions at an exorbitant price; they are advised to discontinue the practice, and to sell only prints at a moderate charge, being assured that their interests, as well as those of the public, will be benefitted by a considerably increased sale. It is difficult to say that a man who has had many years' experience of his business knows not in what direction his chance of success lies, and that he ought to be guided by those who know nothing about his trade, except from theory or sentiment. The abuse which is well known to have been practised in the sale of *proofs*, especially those termed "artist's proofs," cannot be too strongly reprobated, and if any mode could be adopted to do away with the system of having so many classes of proofs it would be as well; but there will always be amateurs ready to pay an advanced price to secure an article of comparative scarcity, and the origin of the system is simply this: in former times an engraver was allowed to retain a limited number of impressions from his finished plate before delivering it up to the publisher for publication; this number varied from six to eight, rarely exceeding ten: these proofs bore no other name or signature but the name of the engraver, scratched in the plate with an etching point by himself. The publisher then had the margins well cleaned, and his name and address engraved in small letters, and no title yet; and the impressions, limited in number in *those days*, were sold as "proofs before letters," to distinguish them from those that were subsequently printed after the title and designation of the subject had been engraved at the foot of the plate. It so happened that some amateurs became aware of the existence of a state of the plate antecedent to that which they had purchased as the first-class proofs, and they were anxious to obtain the proofs kept by the engraver, as being the very best of all, and to which the name of the artist's proofs was given. The publishers soon found out they could realise a good profit from the sale of such proofs at a high price, and they had some printed off, firstly in moderation, and gradually increasing in number as the demand for them extended, until, in a memorable case of a highly successful engraving from a modern English artist, the publisher had so many artist's proofs struck off (a *limited number only* to be published, so ran the prospectus issued) that the copper plate had actually to be repaired before the *prints* began to be printed.

The quotation in the article above alluded to of a well known historical engraver, that "it was customary for the engraver to receive two-thirds of all proof impressions actually printed before the delivery of the plate, is obviously an error, and no publisher in his senses could subscribe to such a condition; in all cases the number is limited before-

hand in the written agreement between the parties, and six to ten is the usual number allowed.

In concluding, it is necessary to endeavour to refute an opinion put forward, no doubt in sincerity, but equally erroneous, that the sale of a valuable engraving could be enhanced by the publication, simultaneously, of a photograph of a reduced size and price. The contrary has been proved to be the result, and those publishers on the Continent who have resorted to the recent practice of having some of their fine engravings photographed and published by themselves, have only done so after they had exhausted their chance of selling the engravings on their merit.

Many plans have been suggested, but only one would be likely to abate, perhaps to cure, the evil; this would be, the introduction in the amended law on artistic copyright, to be brought before Parliament, of a stringent clause making it compulsory for any photograph, large or small, not to be allowed to be sold or to circulate except with the name and address of either the producer or the publisher thereof, and a heavy, not a nominal penalty, easily recoverable, for any and every copy found contravening, besides confiscation. By such means only can the dishonest practice be combated, and there will no longer be a difficulty of punishing the real culprit; any one found dealing with anonymous photographs must do it at his peril, and amateurs' productions can never come into the market as such, and without bearing any designation, under pain of being seized and destroyed, besides the penalty incurred for each offence.

ON SOME OF THE CHANGES WHICH TAKE PLACE IN PHOTOGRAPHIC MATERIALS AND CHEMICALS AFTER A LENGTHENED DISUSE.

BY JOHN BOCKETT.*

HAVING done comparatively very little in photography for a period extending over nearly two years, I was surprised the other day, upon having my glass house and laboratory thoroughly cleaned out and put in order, at noticing the ravages that time alone had made with the materials and chemicals contained therein. Although in all probability this short communication may not contain anything that is new, but, in fact, really easy of explanation, still, sometimes, out of a great deal of rubbish some one grain of novelty may be extracted.

The first matter on hand was repapering the window of the photographic dark room, and for this purpose I have always used an orange-coloured paper, two thicknesses of which were simply gummed to the inside of the window-frame (the plan of using chrome yellow on the glass being very good, but, to those who practise photography purely as amateurs, and who will some day or other have to leave their residence, not an easy thing to get off when once on). To resume: upon stripping the old paper away, that nearest the window had become completely bleached, and, what was more extraordinary, had become so completely decomposed as absolutely to fall to powder. I am, of course, aware of the bleaching power of the sun, and that in all probability the colouring matter of the paper had been turmeric, but the extreme rottenness is not so easily explained. With regard to the article which accumulates everywhere—I mean dust—there was no lack, and a very curious conglomeration it is; so much so that the circumstances under which it is deposited, as also its composition, in all probability, will form the subject of a short paper at one of the microscopical societies to which I have the honour to belong, and to which it is more referable than to a photographic society.

Before commencing any attempt at negative taking, it behoved me, as every photographer will suppose, to go through a proper amount of filtering; and I feel sincerely obliged to Mr. Hart for his filtering apparatus, which at once operated after having had the negative bath

solution standing in it undisturbed for so long a period. But even with this apparatus something was to be learnt. The powdered glass and felt was all right, but the India-rubber tubing was anything but up to the mark. Mind me, I find no direct fault with it, as, for the time being, the tube acted as it should do; but the nature of the rubber is most undoubtedly changed. It is now no longer the supple, pliable article it once was, but is rigid, and retains the form of coil in which it was placed when the bath was set aside.

My next examination was of the bath after filtration. I always have used (and consequently this one was) a decidedly acid bath; but, to my great surprise, the solution was very alkaline; so much so that exceedingly red litmus paper rapidly assumed its blue colour. As we all know that glass in a state of division is partially soluble, may that have had anything to do with the matter? At all events, when acidified with a drop or two (I think about five minims), the bath for stereo-plates gave as clean negatives as possible.

A word now on our next article—pyrogallic acid. The bottle containing this substance, and devoted thereto for the last ten years, has gradually attained a brown deposit, which tenaciously adheres to the side, and preserves the fresh pyro. put therein. The dry pyro. was as good as ever, but wherever the acid had been mixed, either with citric or glacial acetic acid, decomposition had set in, and, even when mixed with pure alcohol, had become as black as ink. Another fact also cropped up with the citric acid: clots of mould had formed, and would render the solution perfectly useless; but with the glacial acetic acid this did not appear to have taken place. I regret now I did not filter each, so as to ascertain, in spite of the objectionable colour, whether any reducing power was still left.

We next arrive at collodion. That which I have always used has been Mawson's, and I think I have some that must be nearly as old as the firm who made it; but I contend that every practical photographer should know to a day the age of his collodion. This idea struck me almost as soon as I began to practise photography, and I used to stamp out with a gun punch discs of gummed paper, which I attached to my collodion bottles; but this involved some little trouble and, I fear, sometimes was omitted altogether. An improvement upon this plan was to make the top of the collodion bottle-cap rough, and then with a lead pencil write the date of mixing, thus:—9-4-67, &c. It so happened that the purpose for which I wanted it was for copying, and, although slow, still it worked very clean; but, for portraiture, the whole of the half shadows were gone. Even the old collodion possessed considerable vitality.

With regard to my fixing agents: the cyanide of potassium had deliquesced in the stoppered bottle, but in solution remained as powerful as ever, while the hyposulphite of soda remained perfectly good, although the crystals were kept in a loosely-stoppered jar; also in solution it was as good as ever.

The foregoing gets us through our negatives, but still we have the vicissitudes of printing. The paper I always use is the ordinary albuminized Saxe, and, although we all as a rule like freshly-prepared paper, I am bound to say that this worked as well as if purchased only the day before. The silver bath, prior to using, was, of course, filtered, and I was surprised to find the heavy deposit of black (I presume) oxide of silver; but still the solution sensitized the paper as well as could be.

With respect to the chloride of gold: my practice always was, and would be, the moment a capsule was broken, to convert it into a solution of one grain to the drachm of water; and this I found was perfectly unaltered.

The toning bath which I use is that prepared with chloride of lime described long ago; and although I could hardly hope an old toning bath would act satisfactorily, still, by adding to the 20 ounces which remained about 2 drachms of the solution of chloride of gold, all went as well as if kept at a proper age on purpose. Even the old solution of

* Read at a meeting of the North London Photographic Association, May 11, 1868.

hypo acted well, the smell of the muriate of ammonia which I used always to add being still apparent.

But though this virtually solved all doubts as to the present condition of my chemicals with regard to taking a negative and printing therefrom, there remained a few which I had a look over. Protosulphate of iron, phosphate of soda, bichloride of mercury, were unaltered; but sulphocyanide of ammonia had become red and partially dissolved; citric acid pink, although kept entirely in the dark. The neck of the nitric acid bottle, curious to say, had got a crop of acicular crystals around its neck, and solution of uranium had assumed a most splendid purple; in fact, as a friend of mine said, the very thing for a chemist's show bottle.

Another curious fact was that two or three books of litmus paper had become quite pink, and, although I restored them by means of liquor ammonia, in forty-eight hours they had again gone back to redness. This would almost show that either the bath gave off its acidity, which was alluded to in a former part of this paper, or that the atmosphere had become acid by some other means.

I am very glad to be able to say that, with regard to my lenses, the oxidation complained of by many persons has not attacked any of mine, one or other of them having been made by the firm of either Ross, Dallmeyer, or Grubb.

With regard to residues: I formerly emptied all my washing from printing into an old oil jar, with an American tap inserted about one-third of the way up the jar, adding common salt to throw down the chloride; but the glaze apparently was not strong enough to retain the solution, and the whole of the fluid has percolated through the jar, and simply left the white deposit.

Finally: I lighted upon some old gutta-percha; and if, as it really is, that I have ever had a dislike to this substance for any photographic purpose at all, it was considerably strengthened by the appearance of this substance. Originally a dipper made out of pure gutta-percha, and to my own knowledge possessing considerable elasticity, it has become as dry and rotten as a very rotten stick, and seems to have lost all its former characteristics.

I feel much obliged to you for allowing me to absorb your time; but out of the foregoing I hope some discussion will arise, the more so as I think the decay of the yellow paper wants explanation; also the action of nitrate of silver upon pure india-rubber; the fact of an acid bath becoming alkaline, and whether the powdered glass has anything to do with it; whether other photographers have also found that collodion will, in connection with cadmium, keep a certain amount of sensitiveness indefinitely; that the atmosphere of dark rooms has a tendency to becoming, and that our own English objectives have not a tendency to become, dull by oxidation; and, lastly, that some salts will keep indefinitely when dissolved, and that others will not keep at all when kept in solution.

REDEVELOPMENT BY NITRATE OF SILVER AND CITRIC ACID.

BY JOHN C. BROWNE.*

A few days ago, in looking over some negatives taken during 1864 and 1865, I was surprised to find that a very decided change had taken place, which rendered a number of them almost useless.

The majority, at the time they were taken, were passably fair negatives, of good printing strength; but now many of them are so intense that prints made from them must necessarily be hard and chalky.

At the time these pictures were made I regret to say that I, like many others, was disposed to make negatives entirely too strong, losing thereby much softness and half-tone in the finished prints.

To accomplish this result, many of my negatives were redeveloped with nitrate of silver and citric acid, made in this manner, i. e.:

Water	...	...	...	1 ounce
Citric acid	...	...	...	30 grains
Nitrate of silver	...	...	...	20 "

After developing with iron, wash well, and pour a small portion of this solution over the plate, drain off the excess into a different bottle, and redevelop with iron. My boxes, containing a number of negatives known to have been redeveloped by this process, were examined, and, after careful comparison with others taken about the same time, which were in good condition, no redevelopment being necessary, I was for some time at a loss for the probable reason, and can assign no other cause for the changed appearance of these negatives than the use of citric acid in the manner described.

Those negatives in which the greatest change was noticed had been twice redeveloped, using the silver and citric acid solution each time, but well washed both between and after the operations.

Viewed under a microscope, a great difference was observed in the deposit of silver upon the plates in comparison with negatives taken at a much later date, although redeveloped by the same method.

Collodion used in 1864-65:—

Iodide of ammonium	...	...	5 grains
Bromide of potassium	...	...	2 "

Bath and developer as usual; fixed with hypo, well washed, and varnished with Anthony's flint varnish.

I was greatly in favour of this plan for adding strength to the negative. The process was under perfect control, and when care was exercised the results were uniformly good; but the present difficulty has somewhat shaken my faith in what I have considered one of my most valuable formulæ.

In several cases I have seen negatives from which large numbers of prints had been made rendered very intense from absorption of silver from the sensitive paper; but that cannot be the cause of this trouble, for very few prints have been made, not over half a dozen from each negative.

ON BLURRING, WITH A NEW REMEDY.

BY M. CAREY LEA.*

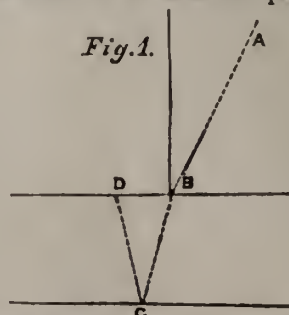
My object in the present paper will be to endeavour to show—

1. That the precise manner in which blurring results from internal reflections has not been hitherto explained.

2. That the remedy applied (wet red blotting-paper on wet plates, painting the back of dry ones), has been a very imperfect one.

3. That in the case of dry plates, at least, a much better treatment may be employed, which principle may possibly be extended to wet plates.

Blurring is usually explained as resulting in the manner shown at Fig. 1; that is, that a ray of light, A B, falling upon the outer surface of the sensitized plate, is refracted



through in the direction B C to the back at C (the thickness of the plate is exaggerated to make the action plainer). At C part is transmitted, and escapes out of the posterior surface

* Read before the Photographic Society of Philadelphia, March 4.

* Philadelphia Photographer.

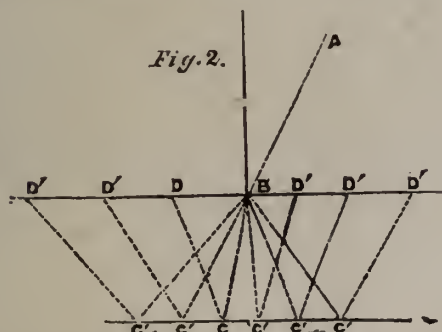
of the glass, but part is also reflected in the direction of C D. At D it strikes the sensitive film, and, being light, not belonging to the part of the image D, it causes the appearance known as blurring.

This explanation may be regarded as a first approximation to the truth, but it fails to explain much that appears on the sensitized plate.

If it were the true explanation, then a blur could only extend a very small distance from the portion of the film where the light entered, because no very oblique rays fall on the part of the camera image that is used in photography, and the unequal obliquity of these is greatly lessened by the refraction which takes place when the ray enters the glass. Consequently, the distance B D, to which the blurring spreads, would always be small, and could scarcely, at most, exceed a distance equal to the thickness of the glass; and even so wide a blur as this could only happen (if at all) at the extreme corners of the plate. Now we know that blurring may extend easily a quarter of an inch, as when, for instance, a large, dark bough of a tree in the foreground stands against the light, cloudy sky.

Again, if the usual explanation represented in Fig. 1 were the true one, blurring could only take place in the direction of a line from the centre of the image to the bright point; for the rays of light that form the image constitute a cone, of which the centre is the centre of the image. These can only be reflected by the second surface in a direction away from the centre. Now we know very well that blurring is an actual fact, controlled by no such law as this, and that it may take place in any direction. Consequently, it follows that the received explanation cannot be the true one.

The cause of this error has lain in neglecting to take into consideration the partial opacity of the film. When light strikes a translucent surface—such as a piece of tissue-paper, for example—it does not pass through in straight rays, but every point in the paper becomes, as it were, a new source of light from whence light is radiated in every direction. When, for example, an engraver places a frame of tissue-paper between him and his light, the rays no longer reach him directly, but broken in every direction. So, where tissue-paper is used for vignetting, no sharp shadows are formed by the light that passes through the paper. As already said, the paper becomes virtually a new source of light. Precisely so with the translucent film of bromide, or mixed bromide and iodide of silver. The rays that strike any and every point B in such a film do not all follow the line B C, as if there had been no film on the glass, but are radiated also in every direction B C', B C'', &c. (Fig. 2.) Striking the back of the plate, they are in part transmitted,



but also in part reflected, according to the ordinary law of reflections, in the directions C' D', C'' D'', &c. It follows, therefore, that the reflected light may be returned to a distance from the point at which it entered much greater than the thickness of the glass, and also that it may come out in any direction whatever around the point B at which it entered, and not in one direction only, as required by the older, faulty explanation represented at Fig. 1. These two results are precisely in harmony with observed facts, for,

when a disposition exists to blur, it will show itself in any direction whatever. It becomes only visible when the existence of a deep shadow renders evident the increased action caused by the displaced light; but it is an undoubted fact that the light may spread inwards and laterally as well as outwards, which it could not do if the old explanation were the true one, nor could it possibly extend so far as it is constantly observed to do.

2. My next object will be to show that although the remedy usually recommended is beneficial, it is necessarily very imperfect in its action.

To cause the rays which pass through the film to pass also through the back of the glass, totally and without reflection, it would be necessary that some substance should be applied to the back which should have the same index of refraction as glass, and also be in optical contact with it. A piece of wet blotting-paper answers these conditions to considerable extent, but not entirely. Water has not the same refractive power as glass, and when the water dries out of a paste its chance of maintaining optical contact is greatly diminished, so that if a reddish or brownish mixture, for example, be applied—such as annatto or burnt umber—it will be evident that the necessary conditions are only very imperfectly fulfilled; and, although such an application may be an amelioration, it is by no means a cure. It is no matter how non-actinic the colour of the substance applied may be; unless it is in optical contact it will have no effect in preventing internal reflections.

But the question admits of a much better solution. It was sufficiently evident that if the film itself could be coloured, then these injurious rays might never reach the glass, and so be deprived of all power of mischief. The difficulty lay in finding an appropriate means.

The first condition I fixed was that the colour must not remain in the finished negative, or else the printing qualities would be injured. This at once excluded the application of colouring agents to the collodion, as these could only be alcoholic or ethereal solutions, and the chances were greatly against finding any such that could be dissolved out again without injury to the film.

The second condition was that the colouring matter must require no treatment whatever to remove it, but must disappear of itself in the developing and fixing.

The third was that it must not require a separate application, but must be dissolved in the sensitizing bath, and so be applied without any trouble. Of course the substance must be one that should not injure the sensitiveness of the plate.

These conditions were so difficult to fulfil that it was long before I could find a substance that seemed even worth trying. I did, however, obtain one that fulfilled all these requirements perfectly. That substance is red litmus—solution of litmus reddened by an acid; and I find the use of this substance not only to effect all that I expected, but even more. So far from taking from the sensitiveness of the plates, it improves them.

The mode of application is as follows:—Hot water is poured upon litmus cakes, enough to cover them; the vessel is covered and kept in a warm place for a day. The litmus becomes in this way reduced to a paste, and yields up much more colour than in the usual way of making litmus tincture. The paste is thrown on a filter, and hot water poured on till, with 3 or 4 ounces of litmus cakes, about a pint (16 ounces) has run through. If the litmus is good, this solution is extremely intense in colour. Add 4 ounces of alcohol, and the solution will keep for a long time.

To the lead bath already recommended add (to 6 ounces of bath) 3 or 4 drachms of this solution; the quantity cannot be stated exactly, as litmus varies in strength; but the bath should be blood red, and the plate, on coming out, light pink in colour. The plate is then dried in the usual way. When thrown into an alkaline developing bath, it first turns bluish, and then presently dissolves out; and in the finished negative no trace of the colour remains.

If the litmus be used in excessive quantity it may cause a slight granularity of the image. This need never happen, however, and does not when the colouring matter is kept within reasonable limits; in fact, I never saw it happen but once, and then when the experiment of a very large portion of litmus was tried.

It is evident, then, that the use of this new means involves far less trouble than painting the back, at the same time that it is far more effective. To paint the back, the annatto bath must be got into good condition for each batch of plates, and must be applied at the risk of injuring the film with the fingers. The plate cannot be supported in a rack without the risk of sticking fast to what the back rests on. Again, before developing, the colour must be carefully removed with a sponge or wet cloth; whereas, with the new method, the bottle of litmus is prepared with ease, and lasts for a long time, and the trouble for each batch of plates is that of pouring a little into the bath once for all; in fact, it is so little as not to be worth reckoning at all.

Although this method was devised expressly for the process which I have lately published, there is no doubt that it is suitable for others, perhaps for all dry processes, especially as the sensibility of the plate (at least in my own process) is enhanced by it. I have not tried it with any but the alkaline development, but there seems no reason that it should not be used with pyro and silver development, and I expect to use it for such.

I take this opportunity of calling attention to a fact that I have lately noticed, that if a developer of carbonate of ammonium be used too strong, it may, instead of continuing the development, exercise a reversed action, and dissolve off the fainter parts of the image. It consequently becomes of great importance, in all alkaline developments, to attend to this. I have seen this action take place with a developer containing about 6 grains of carbonate to the ounce, and as some have advised to use the alkaline solution as strong as 20 grains, it is evident that such a developer must produce harsh pictures by first bringing out great intensity, and then removing the delicate details in the shadows, precisely what it is most desirable to preserve. Whether the 20-grain formula was a mistake or misprint for 2 grains, I do not know; but this much is certain, that the quantity of carbonate of ammonia in the alkaline developer should, at the commencement of the development, not exceed 1 grain to the ounce, and this may be raised to 2 or 2½, but should not exceed the latter quantity if the best results are desired.

MR. CHANCE'S LECTURE ON THE MANUFACTURE OF GLASS.

In his lecture before the Chemical Society, Mr. Chance, of Birmingham, whose name is associated with the finest glass in the world, gave a comprehensive description of its manufacture generally. He stated that the American sand is considered the finest of all; then that from Fontainebleau; Belgian next; and, of English samples tolerably free from iron, the deposits occurring at Leighton Buzzard were in great demand, this quality, though of a yellowish tint, containing less iron than many whiter samples. With respect to the alkaline ingredients for glass making, the substitution of the sulphate for the carbonate of soda—due to Gehlen—tended to cheapen the glass, but at the sacrifice of quality. For the best kinds of plate glass the carbonate (soda ash) is always employed. For the common blown window glass the sulphate answers well: it will permit the use of larger charges of lime, and the glass produced from it is harder, takes a better polish, is less liable to devitrification, and to the alteration of its surface by what is termed "sweating." The addition of carbon in the form of charcoal, or powdered anthracite, facilitates the reduction of the sulphate, and tends to promote vitrification. Only one atom of carbon is, in practice, found sufficient for two atoms of sulphate of soda. The object of its employment would, then, seem to consist in furnishing the means of reduction of a part only of the alkaline sulphate to the state of sulphite, and not to sulphide. Glass made from sulphate of soda is of a bluish, whilst that made

from the carbonate is of a yellowish, tint. When an extra pale colour is desired, the carbon is kept at a minimum.

The average composition of different qualities of glass was stated to be as follows:—

Crown and Sheet Glass.

					English.	Foreign.
Silica	...	...	...	...	73	74
Lime	...	...	...	...	13	14
Soda	...	...	...	...	13	11
Alumina, oxides of iron and manganese	...	...	...	...	1	1
					100	100

Ancient Glass.

					12th century.	16th century.
Silica	...	...	...	...	51.60	54.60
Alumina	...	...	...	...	2.16	8.96
Protoxide of iron	...	...	...	...	1.53	0.75
Lime...	...	...	...	...	8.04	19.31
Magnesia	...	...	...	...	2.22	3.43
Alkalies	...	...	...	...	34.40	12.95
					100.00	100.00

The use of peroxide of manganese and arsenious acid in glass making is mainly for the purpose of effecting the peroxidation of the iron, which, in this state, has far less colouring property. The Belgian manufacturers are said to have discontinued the use of the above metallic oxides. The purest coloured flint glass is composed of sand, potash, and oxide of lead. For some kinds of optical glass a portion of the red lead is replaced by lime, and if the lead is used in excess the heavy flint glass produced has a strong yellowish tint. When much manganese is employed to correct the colour arising from impurities in the glass mixture, there is a tendency for the glass to undergo changes of colour upon exposure to sunlight; and a greenhouse rooted with glass in which manganese has been used will often display after a lapse of time a great variety of tints. After referring to Mr. Gaffield's experiments on the action of sunlight upon glass, and to the practical conclusion arrived at, to the effect that the alteration in colour was solely due to the different states of oxidation of the manganese, the lecturer asserted that he had noticed changes of colour in glass which did not contain a trace of this metallic oxide, and specimens were exhibited in which the glass, originally white, had become strongly tinged with yellow.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held in Myddelton Hall on the evening of Wednesday, May 6th, Mr. G. WHARTON SIMPSON in the chair.

The minutes of a former meeting were read and confirmed, and Mr. H. Buttrum was elected a member of the Society.

The CHAIRMAN called attention to some fine examples of photography exhibited by Mr. Hill, consisting of flowers the size of nature, by Fredricks, of Berlin. By the use of a concentrated light from one direction, the flowers were made to give cast shadows on the screen to which they were attached, and this, together, with the excellent photography, produced a wonderful effect of relief. The Chairman also called attention to some very fine examples of Mr. Woodbury's process, and to a sample of Marion's transparent pellicle.

Mr. BOCKETT then read a paper on the Changes in Chemicals during lengthened disuse (see p. 233).

A general conversational discussion followed on the various points raised in the paper.

Mr. HILL mentioned an experience with old pyrogallie acid, which, without any change in colour, had the peculiar property of giving a blue kind of deposit all over the negative.

After some general conversation, in which the Chairman pointed out that the deterioration in pyrogallie acid by keeping was generally shown in its discolouration, from having absorbed oxygen, a conversation on the subject of the deterioration in the india-rubber tube followed.

The CHAIRMAN pointed out that india-rubber was really a photographic substance, and was acted upon by light and air, losing its elastic character, and becoming hard, insoluble, and resinous.

Mr. BOCKETT said that the tube he had mentioned had been kept in the dark.

Mr. HART said that immersion in boiling water would, in all probability, restore its pliability and elasticity. He often found that india-rubber got hard with age; but if it were pure—and he only used the pure in his filters—immersion in boiling water, or boiling for a few minutes, restored it.

After some further conversation,

The CHAIRMAN stated that he had kept a sample of collodion which he had made, which contained mixed iodides and bromides of cadmium and sodium, for upwards of three years without deterioration. Mr. England made it a practice to keep a stock in his cellar ripening, preferring to use it at least two years after mixing.

Mr. SMITH said he believed that Mr. Ponting's practice was similar.

A conversation on the acid bath becoming alkaline by standing followed; the only suggestion of a cause being the possible effect of the alkali in the powdered glass in the filter or in the glass vessel.

After some further desultory conversation the proceedings terminated.

LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, May 12th, Mr. J. GLAISIER, F.G.S., in the chair.

The minutes of a previous meeting were read and confirmed, and Mr. E. Ernest Dymond was elected a member of the Society.

Mr. McLACHLAN then proceeded to read a paper stating in fuller detail the mode of working he described at the last meeting. He dwelt on the fact that distinctly different results were obtained by different samples of the nitrate of silver or sulphate of iron employed. Boiling the solution of some samples of the iron salt with a little "alkaline alcohol" was necessary to get the alcohol into "chemical combination" with the water. He considered the use of bromides in the collodion and of nitric acid in the bath decidedly injurious. At the conclusion of his paper (which will appear in our next) he said that he was fully prepared to meet with incredulity. He would not himself have believed similar statements made by other persons. The truth of what he had said could only be tested by experiment, and he was fully prepared to go to the test with any committee which might be appointed.

Mr. SEBASTIAN DAVIS, after some remarks on the interest of the subject, said that he understood Mr. McLachlan to recommend absolutely neutral collodion and bath, and very acid developer. The addition of an alkali on the collodion would, however, in some cases, tend to make it so powdery that the film would not hold the sensitive salts. In regard to the objection to nitric acid he agreed with Mr. McLachlan. He always neutralized any trace of nitric acid present in a new bath, and then added acetic acid. The difficulty which arose as to the developers was, that whilst Mr. McLachlan recommended different kinds of sulphate of iron for different purposes, he left them without information as to the differences in the samples. He proposed that some specimens be placed in the possession of the Society for analysis. He hoped that the enquiry stimulated by Mr. McLachlan's communication would aid in eliminating uncertainties from their practice.

Mr. FRY thought they now had the matter in a nutshell, and they could form a definite opinion of its value. Those who liked a spade called a spade would be pleased with the plain speaking of Mr. McLachlan, and he thought they ought to deal equally plainly with the subject in discussion. He should therefore make one or two remarks on Mr. McLachlan's statement. He had said that the vagaries of the nitrate bath were so perplexing that no experience was sufficient to conquer them. Now was this so? Ten years ago such a statement might have appeared true, as at that time they knew much less than was now known. But were the mass of competent and capable photographers now in that position? He certainly believed not. Mr. McLachlan, it appeared, thought otherwise, and he had given them a remedy which seemed to him most unlikely to aid them, but which they must wait in any case for three months before they could apply. He must confess that as a whole he could not regard the matter favorably. It seemed to him to be utterly wrong to begin with an impure nitrate of silver, and then spend three months in getting rid

of the impurity. He believed there were plenty of pure samples to get. He believed that, as a rule, photographic chemicals were as pure and as honest as any product of any kind sold in the world. The chief difficulties which at any time arose were simply due to want of experience. But the want of experience in individuals must not be taken as an illustration of the condition of photography among competent men. For instance, they had at a recent meeting an interesting statement of the difficulties of an amateur in South Africa, from which they might have been led to believe that Natal was as full of troubles to the photographers as to the ecclesiastical world; but the simple truth was, these difficulties arose from want of experience. In fact, he must say that he agreed with a recent writer* who said that the error of Mr. McLachlan was that he under-rated the capabilities of photographers. But if some people would make very small baths, and use them much, or would doctor their baths, they ought not to be surprised if at times they were beset with troubles and uncertainties.

Mr. SPILLER said the especial aim of Mr. McLachlan appeared to be to introduce harmonious conditions into the preparations with which he worked. For this aim he gave him all credit; but when he entered into the detail of his propositions he felt somewhat at a loss. When Mr. Foster and himself received the communication upon which they had already reported, they found a difficulty in the fact that Mr. McLachlan frequently used terms in which he gave a new sense to old definitions. For instance, he had talked to-night about alkaline alcohol, whilst chemists knew that alcohol could neither be acid nor alkaline. Then they were, at the outset, at a loss to identify the various salts described, and to the present time he had no idea of what the peculiarity of the nitrate of silver recommended consisted in. Could Mr. McLachlan now show him a sample?

Mr. McLACHLAN handed an unlabelled bottle containing white crystals to Mr. Spiller, who pronounced the contents to be iodide of potassium. The mistake being rectified, and a sample of the nitrate of silver produced and examined,

Mr. SPILLER proceeded: Of course he could not venture to speculate on the nature of the impurity present in the salt at present, but he had been led to believe that it was not improbable that it contained chloride of silver in combinations, and a sample which he now produced contained one per cent. of chloride in combination with the nitrate. In his remaining observations he would read some brief notes of the experiments he had already made:—

Ten days after Mr. McLachlan described his new system of producing negatives in the statement made at the last public meeting of this Society, I published in the PHOTOGRAPHIC NEWS (April 24th) a letter or article entitled "Observations on Mr. McLachlan's Process," in which I suggested the possibility of chlorine taking part in the decomposition said to occur when the nitrate of silver in the form of emulsion solution is exposed to sunlight.

My grounds for believing in the possible occurrence of chlorine were, firstly, the description given of a special quality of nitrate of silver which is sometimes to be met with in the form of "moist and dirty-looking crystals," such as would ordinarily be rejected by photographers, but now is to be preferred. Secondly, that chlorides are amongst the most commonly occurring impurities in water, and are almost invariably contained in commercial qualities of nitric acid; so that in the preparation of nitrate of silver from an inferior acid and the use of anything but the purest description of distilled water, there would be some probability of chloride of silver being intermixed with the nitrate, and forming a combination which is affected by exposure to light.

I have since made direct experiments on this point, and find that chloride of silver is much more soluble in the nitrate than my previous experience led me to anticipate. I exhibit a sample of crystallized nitrate containing one per cent. of chloride of silver in intimate union, if not, indeed, in direct chemical combination. Such a product must always be in the form of small crystals, and, unless special precautions are adopted, would invariably be discoloured by light. I made it by dissolving 1·17 grains of rock salt (pure chlor. of sodium) in a small quantity of water, and adding 340 grains of pure crystallized nitrate of silver. The precipitate at first formed soon became redissolved upon warming and consequent evaporation of the water, the chloride of silver being, to a certain extent, soluble in a strong solution of the nitrate, and apparently having the power of crystallizing with it. A special experiment to decide the extreme limit of solubility of the chloride and a warm saturated solution of the nitrate showed that it was possible to dissolve as much as 4·7 parts of chloride in 100 of the nitrate. A compound containing this high proportion of chloride cannot, however, be manipulated, for on adding a mere trace of water the white curdy precipitate begins to

* See Echoes of the Month in our issue for May 1st.

appear. The fact of such a combination being established lends support to the opinion I have hazarded respecting the chemical quality of the silver crystals employed by Mr. McLachlan. I do not, however, mean to assert that his black-looking article contains more than a trace of the chloride, but the presence of this body, even in a small amount, must be allowed to have great influence in altering the properties of so delicate a chemical preparation as the nitrate bath.

A few words, finally, with respect to the amount of acid liberated in the trials by which the success of Mr. McLachlan's expedient was in my hands established. I used 1 grain only of chloride of sodium to 700 grains of nitrate of silver, and the mixed nitric and hypochlorous acids, liberated at the end of seven weeks' uninterrupted exposure to daylight during February and March, were neutralized by 30 drops of a $\frac{1}{2}$ -grain solution of caustic potash, equivalent to 1 32nd part of a grain of solid potash, which, compared with the amount of silver nitrate originally taken, stands in the ratio of 1 : 22,400. In another experiment, performed in Mr. McLachlan's presence, without the chloride, the acid liberated was so small in amount that 6 drops of a 1-grain solution of caustic potash proved more than sufficient to neutralize it; in this case the ratio stands as 1 : 56,000. These statements will illustrate some of the difficulties encountered in the chemical investigation, and would lead one to hesitate in adopting Mr. McLachlan's assertion that nitrate of silver in pure aqueous solution suffers decomposition on exposure to light.

Another point upon which he would offer an observation was the alleged precipitation of the iodide of silver. In his experience this had never taken place. He would not enter into detail as to his reference to ozone; but would simply remark that Mr. McLachlan was under a mistake as to the nature of that body. He had described his theory as embracing an idea that "oxygen was absorbed by the silver from the water, actinism, and heat combined, changing it into a kind of ozone." Now, if his (Mr. Spiller's) notions of chemistry were right, ozone was an allotropic condition of oxygen. Silver could not take oxygen from water, because the affinities lay in an opposite direction; but if the silver could take oxygen from the water, it would form oxide of silver, and liberate hydrogen, the presence of which would be incompatible with the generation of ozone.

Mr. HOOPER said it would be somewhat premature to come to any conclusion on the subject at present. He thought the idea of adjusting the collodion, bath, and developer to each other was very important. As to the use of acetic acid in the nitrate of silver solution, he objected to it as generally increasing exposure. Without entering into details he thought all would be agreed that Mr. McLachlan had done a good thing in bringing his process before this Society, where the knowledge of scientific men being joined to his own practical experience, the best results might be hoped for. He did not quite agree with Mr. Fry as to the competency of photographers generally, as, within his knowledge, much uncertainty prevailed. He thought that photographers would gain by keeping at least three or four baths constantly in use, so as to avoid over-working any of them. He should like to know if Mr. McLachlan had tried working his baths, seeing that boiling the developer was so useful; in his experience he found boiling as good as sunning.

Mr. McLACHLAN had not expected that he would be believed at once. All he wanted was attention, examination, and experiment. If he were wrong he was the only loser, as he had spent much time in the experiments, and money also, as well as in his present efforts to bring the matter before photographers. As to Mr. Fry's statement that photographers were better informed than he gave them credit for, it might be; but he could only judge by the published information. It was quite possible, and he was disposed to believe that much more information existed amongst practical photographers than was to be found in the journals. Mr. Davis said he used excess of acetic acid in his developer, but this was an error. It had been reported in some of the journals that he used $3\frac{1}{2}$ ounces of acetic acid in 16 ounces of developer, but this was a mistake, he only used $3\frac{1}{2}$ drachms.* As to the collodion he knew he was right in what he had said. He had made 6,000 samples of gun-cotton, and had cart-loads of it by him; he had made many more thousands of samples of collodion, and therefore spoke with experience. It was an error to suppose that his was simply a neutral bath. It was a bath distinct from any other usual bath, and would dissolve a very large amount of oxide of silver. Mr. Spiller's experiments did not meet the case; his

two baths were not put out at the same time, and that which was spoiled, instead of receiving 6 drops of the potash solution, had had a much larger quantity. Mr. Spiller poured quite a gulf of the solution into it. He repeated that his was a bath different to any that photographers had hitherto imagined, as they would find if they would only experiment.

The CHAIRMAN said it was scarcely necessary to ask them to give their hearty thanks to a gentleman who had taken the trouble Mr. McLachlan had done to bring his experiences before them. He could confirm the remarks as to the importance of maintaining, as nearly as possible, uniformity of temperature in all the preparations, as it accorded with their photographic experiences at the Royal Observatory. He thought, perhaps, it was probable that Mr. McLachlan scarcely did justice to the skill and success of practical photographers of reputation. He had been struck with the uniform excellence and freedom from defects of all kind in one plate after another in long succession. Possibly these practical men might not have published all they knew, as it was sometimes difficult in matters gained by experience for a person to say exactly what he did know. However, they would heartily thank Mr. McLachlan.

Thanks were accorded by acclamation.

The CHAIRMAN, in offering Mr. McLachlan the thanks, asked him on some other occasion to let them have his experience in a tabulated form.

Mr. McLachlan promised, and hoped the Society would appoint a committee to test his mode of working.

The CHAIRMAN called attention to the specimen of the presentation picture which Mr. Robinson proposed to give to the members.

Mr. DUNMORE promised to bring before the next meeting a tent, and Dr. MANN promised to exhibit some examples of the work of Professor Piazzi Smyth.

The meeting then adjourned.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Tuesday evening, the 28th ult., at the Free Public Library, William Brown Street, Mr. J. HENDERSON, Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Joseph Sillitro was elected a member of the Association.

Mr. GREEN called attention to the great number of pictures on the table, all of which had been taken this year. He remarked that he attributed the fact of so much work having been done so early in the season to the simplicity of the collodion-bromide process.

The CHAIRMAN recorded his experience with various toning solutions, advocating phosphate of soda, which he had taken into use in preference to carbonate. He had used acetate of soda, but preferred phosphate.

Mr. BOLTON remarked that acetate of soda was the most economical, especially for amateurs.

Mr. GREEN had used acetate of soda for some time, and certainly found it the most economical; but he had given it up in favour of carbonate, which was more convenient.

The CHAIRMAN said he would like to ask the opinion of the members with regard to the action of light upon collodion-bromide plates after fixing and varnishing. He was inclined to think that exposure to light in printing had the effect of rendering the negative more dense; and he had intended making an experiment in that direction, but had not had time to do so.

Mr. PURVIS said he had made the experiment, some time ago, of exposing a negative to the light for about three weeks, with one-half covered with non-actinic varnish; and at the end of that time the colour was changed all over the plate from brown to purple, but no difference could be detected between the two halves.

Mr. GREEN's experience led him to state that the negatives do intensify after fixing, to a certain degree, and that the same effect is noticeable in wet plate negatives developed with an organic developer. It was a peculiarity which need cause no inconvenience, and might be easily met by exposing the negative to sunlight before varnishing, when, if rendered too dense, it might be reduced with cyanide.

Mr. LEWIS HUGHES passed round a print from a negative taken a few days previously upon a Hill Norris plate which he had had in his possession upwards of seven years, and which had apparently suffered little by its long keeping.

* Mr. McLachlan undoubtedly said in the meeting $3\frac{1}{2}$ drachms of acetic acid, and we find it so stated in the shorthand notes; but he subsequently, in a conversation with ourselves, in which we asked him to verify the formula, corrected the former statement, and said $3\frac{1}{2}$ ounces; hence the confusion.—Ed.

The Rev. S. BYRTH brought forward an arrangement by which the ordinary portrait-camera might be adapted to the purposes of enlarging and printing.

After some remarks upon the definition of enlarged pictures, Mr. LEWIS HUGHES said the lenses he used for enlarging were Dallmeyer's triplet of 7 inches focus, and the ordinary single lens of 6 inches. With the solar camera he obtained the finest definition with the single lens, but with diffused light the triplet gave the best results. He also said that with ordinary lenses it was very difficult to produce negatives suitable for enlarging, and that two negatives, which to the eye appear equally sharp, frequently give very different results when enlarged.

Mr. ROBERTS thought that if, in focussing, a magnifying power of 3 or 4 diameters were used, the negative, when enlarged to that extent, would be as sharp as it appeared on the focussing-screen.

In reply to a suggestion that opal glass placed in front of the negative would give a beautifully diffused light for enlarging,

Mr. HUGHES said that the employment of opal glass in the manner suggested would cause such an immense loss of light, that enlarging to any considerable extent would be impossible.

Mr. W. H. WILSON thought that if the pocket camera found its way into general use, some process would have to be adopted, based upon the employment of albumen instead of collodion, in order to obtain the best results, in consequence of the great difficulty of obtaining a film of collodion sufficiently structureless for enlarging purposes.

Mr. GREEN said that collodio-bromide, if properly prepared, might be used with advantage, the film being extremely clear and transparent. If, in making the collodion, alcohol containing a large proportion of water were employed, such collodion would be useless for enlarging.

Mr. HENDERSON thought that a great deal as regards the density of the collodio-bromide film depends upon the length of time allowed to elapse between the preparation of the collodio-bromide and coating the plate. Opinion seemed to differ as to the exact time necessary, but it was generally understood that the longer the mixture was allowed to stand after adding the silver (of course within certain limits) the denser would be the resulting film: the length of time he (Mr. Henderson) generally allowed was three or four hours.

Mr. BOLTON said that the majority of the plates he had exposed this year were prepared within an hour from the addition of the silver to the collodion.

Mr. ROBERTS said he would like to ask Mr. Bolton what quantity of silver he used under such circumstances.

Mr. BOLTON, in reply, stated that he had always used 11 grains to the ounce, except upon one occasion, when, having used 12½ grains, he could not develop a picture.

Mr. HUGHES asked if any of the members had used the permanganate of potash plan for "doctoring" baths. He had three or four baths which were afflicted individually with all the faults it was possible for a bath to possess. They were mixed together, and were in an equally bad state. Altogether the quantity was about 80 ounces, to which he added two fluid drachms of a 10-grain solution of permanganate of potash, allowed to stand for 24 hours, and then filtered. The result was a bath without a fault.

The CHAIRMAN had "doctored" a bath of 40 ounces in the same way. It was not, however, so sensitive as a new one.

The first out-door meeting was discussed, and referred to the council.

The presentation pictures were distributed to the members present, the subjects being Frith's "Rosenlani," and three of G. W. Wilson's cabinets, York Minster, Loch Katriue, and Loch Tummel.

Correspondence.

PHOTO-LITHOGRAPHY.

SIR,—In the News of May 8th, a very personal letter appears, signed Dinsdale and Co. (the signature, by-the-by, like the letter, is, I believe, a mistake). The personal part is not worth much notice, as coming from a pupil to whom, as well as to his then manager, I taught litho-photography gratuitously. Part seems to be meant for you, Mr. Editor, and some one else, because, as I have not had the pleasure of holding conversation with you for some months (and certainly I have

not written to you about silvering stones), the sarcasm identifying me as your "authority" is without meaning. Now, sir, may I guess the name of your "authority?" I should say it was Common Sense. I would like your readers to note those two statements made:—"An apprentice in lithography will be in a position to explain as to what the effects of lithographic chalk may be when being put upon a silver surface, or indeed any other surface but the cleanest surface of the stone itself"—"and therefore will confine ourselves simply to the declaration that our productions are the results of photographing direct on the stone with materials capable of yielding proofs in printers' ink only." The clear inference which any one would draw from the above statements is, that the prints in question are obtained direct on the stone by photography without hand labour. This I candidly admit I do not believe, for in addition to my own experience on that point, I have been favoured with the unasked opinion of a well-known lithographic artist, who told me how they were produced; and he requests me to give his statement in contradiction to the declaration in the letter referred to. And he further offers to present to you, free of cost, for the benefit of your readers, a portrait on stone of any well-known celebrity you may select, which shall be produced in your presence if convenient to you, by that silver process declared to be so absurd; then it will be competent for your erratic correspondent to fix upon your "authority."—Yours respectfully,

W. GRIGGS.

[We shall have much pleasure in arranging to be present to witness the production of such a portrait for our readers.—Ed.]

MODIFIED HONEY PROCESS.

DEAR SIR,—Hastily replying to "M. N. L.," I can only repeat my original directions so to mix the honey and water as to "make a thin syrup." Samples of honey vary so much that a precise formula suited to one sample would not give a sufficiently limpid product if used with another.

The syrup should flow *easily* over the plate, and be about the consistence of a mixture of equal parts of pure glycerine and water. Two drachms of *pure* animal charcoal will be sufficient for a pint of the solution (or syrup).

The plates will keep from four to twelve hours, according to temperature; and I do not think it at all a matter of consequence at what part of this interval the exposure takes place. Still, after some hours' keeping, I should expect a slightly-increased exposure to be advisable. I have not in any case found any flooding with water to be necessary, simply commencing to pour on the developer in the ordinary way. Owing to the presence on the film of a considerable portion of free nitrate, care must be taken, in using an iron developer, to avoid stains; but I recommend the gelatin-iron developer now, although I have not yet had an opportunity of trying it.—I am, dear sir, yours truly, in haste,

GEO. ROBT. FITT.

Talk in the Studio.

NATIONAL PHOTO-ZINCOPHGRAPHS.—It is stated that the publication of the National Records of England and Scotland will probably be completed in the course of the present year. It is proposed then to publish the facsimiles of National Records of Ireland. There is a steady demand for the facsimile of Domesday Book; the sum of £3,556 has been expended in the publication, and at the end of February £1,938 had been received from the sale of copies, and the copies in store would produce £1,900, so that the sale would more than cover the cost of publication.

THE ABYSSINIAN EXPEDITION.—The last report of General Napier says:—"The photographers have been employed in photographing, printing, and mounting plans executed by the Quartermaster-General's Department of the route followed by the army; these plans are used as distribution maps. All the baggage of the army having been left at Lat, the photographic apparatus was left there also, but has been ordered up."

PHOTOGRAPHIC NOVELTY.—If, as a general fact, we admit that "there is nothing new under the sun," our readers may well be

startled in these days by the idea of a photographic novelty. Indeed, it is difficult to say in what branch of art, science, trade, commerce, amusement, &c., photography does not play an important part. It brings with equal facility within the ken of tarry-at-home travellers the most inaccessible Alpine solitudes, and the soft luxurious repose of Italian lakes. It renders the features of every celebrity of the hour, from Mr. Gladstone to King Theodore, familiar to the public eye; and every policeman carries in his pocket the pictures in little of the ticket-of-leave men who, by the amiable weakness of justice, are let loose upon his beat. Trade, however, has taken a hint from Scotland Yard. We have before us a circular stating that a certain individual, in a particular business, has commenced for himself, and enclosing a carte-de-visite of the enterprising tradesman; from which, he says, the ladies to whom he sends his circulars and his portraits "will doubtless recognise him, on account of the active part he took in the business of," &c. It need not be added that "devotion to business," and "undeviating attention to the wants of customers," are expressed in every feature of this interesting masterpiece of photographic art.—*Standard*.

FINISHING PRINTS.—The following method for varnishing photographic prints is recommended by a correspondent of the *Archiv*:—"A piece of plate-glass is heated, and, while yet warm, a little wax is rubbed over by means of a piece of cotton-wool; water is then poured over the plate, and the moistened picture laid thereon and pressed closely down by means of a piece of filtering-paper. When dry, the picture is removed, and will be found to possess a surface of the greatest brilliancy, which is not injured by the process of mounting."

BALLOON PHOTOGRAPHY.—A correspondent is working a plan for photographing all around at once. He mounts eight cameras in a balloon, pointing in different directions; and when his balloon is at the proper height he exposes eight plates simultaneously. In case of war, he thus proposes to secure a quick view of the country all around any given point.—*Philadelphia Photographer*.

To Correspondents.

L. T. C.—We stated that the new intensifier consisted of a solution of permanganate of potash; this is Condry's red fluid. The green fluid is a solution of the manganate of potash.

W. STURGEON.—The peculiarity you describe is not uncommon. It frequently happens that when methylated ether is used, the collodion, when first mixed, often acquires a deep colour from the liberation of iodine, and afterwards becomes quite colourless from the re-absorption of the iodine. On further keeping it is probable that the collodion will again acquire colour from the liberation of iodine. If any tendency to fog is manifest, add a little tincture of iodine; there is nothing whatever objectionable in the proceeding.

W. CROUCH.—You have begun on a difficult subject. It is very difficult to get a good copy of a photograph on albuminized paper. The really effect to which you refer arises from the light reflected from all the little inequalities of the surface giving an exaggerated effect of texture. It is better to begin by taking actual objects or persons, rather than copies. But if copying be more convenient to you, try your hand upon an engraving, which is much easier than a photograph to copy. Send us prints from the other negatives of which you complain, and we can probably advise you as to the defects and remedy.

W. J. A. G.—It is probable that some of the dealers can procure for you Hancock's india-rubber canvas and solution; but we do not know of any dealer by whom the materials are kept. So far as our memory serves us, the manufactory is in Goswell Road. 2. A strong shellac varnish answers well; or a mixture of plain collodion and boiled linseed oil. 3. The glass rod of which you speak may be made useful; in our own practice we find that by carefully and gently raising the paper from the bath, very little superfluous solution is brought away, and that a very slight draining effects every purpose. 4. For stereoscopic work, a lens (to a single lens we refer) of 6 inches focus would be more useful than one of 4½ inches focus.

THOMAS STORHARD.—You do not state the history of your chloride of gold solution; but we think it probable that it is some you have made from which the acids have not been sufficiently evaporated to begin with, and the solution still contains considerable free nitric and hydrochloric acid. Try proceeding as follows:—Take of the stock solution a quantity containing a grain of chloride of gold, and add carbonate of lime freely to neutralize the acid; then, in an open vessel, add 5 or 6 ounces of boiling water, and let it stand for an hour or two to cool. Then try it for toning, and let us know the result. 2. We shall publish the formula when we receive it.

3. We are glad you like the articles. Something on the subject of your enquiry shortly.

ZENO.—You cannot commit the common and probably natural error of the very young student. You wish to have a simple formula, instead of having to master principles. Instruction how to act in some particular case or cases is of little value, because of limited application; but a knowledge of principles, giving new results in every varied form of application, is of much higher value. When you have studied more, and more carefully, you will feel less disposed to dictate as to what you will be taught or how you will be taught. At present, it is clear that you have not studied, but only skimmed a little here and there, which is worse than useless. There has been no such attempt as that to which you refer.

N. JOCELYN.—The letter to which you refer never came to our hands. Mr. England intensifies with pyrogallie acid, with acetic acid, and a few drops of silver solution. There appears to be no difficulty in getting intensity. 2. The cotton is generally obtained, we believe, in Paris, at the *Maison Sennez*. Thanks for the suggestion as to using imperfect plates, which we shall insert shortly.

C. B.—Mr. Maxwell Lyte's rapid or "instantaneous" process with honey was published in the second volume of the *Photographic Society's Journal* in 1851. 2. The charcoal is to remain in the mixture during exposure to light. 3. The charcoal should be in powder, and will, of course, on first mixing with the honey, &c., make it like ink. 4. No; the silver must be in the mixture during the process of sunning. 5. If you want a preservative process as distinct from a dry process, yes.

SILEX.—It is scarcely fair to ask us what are the drawbacks of our collodio-chloride process as compared with the albuminized paper process. We might, with the partiality of parentage, answer, none. We will, however, as briefly as possible, give you some reasons why our process is not, and probably never will be, so extensively used as the albuminized paper process. Collodion is more expensive than albumen; therefore the cost of the process is somewhat greater. Albuminized paper can be purchased ready prepared, and all the following manipulations are easy, simple, and familiar; preparing the collodio-chloride, and coating the paper, require more care and skill. The collodio-chloride process, not having been invented by some one having a commercial interest in working it out, or pushing it, and filling the market with the preparation ready for use, persons interested in it have had to prepare their own materials, and work out the necessary conditions of each batch they prepare. Nothing gives a thing such a fair trial as some one having a commercial interest in its success. For these and other reasons it has not become, and is not likely to become, as popular as the albuminized paper process. Being free from silver in the whites, the prints have a better chance of permanency than albuminized prints, and the pictures are more delicate. 2. When a silver print fades, the blacks generally become a greenish brown, and the whites a dirty yellow, and so contrast and purity are lost. In some bad cases we have seen little remain beyond a faint trace of a yellowish image. 4. A transferred negative on any thin, flexible substance requires care, of course, or it might be injured by creasing. Letters referring to advertisements do not come under our attention, and questions for answer in this column sent in such letters are likely to be overlooked. When you require information on photographic matters, address the Editor in a separate letter. To secure answers the same week, a letter should reach us on Wednesday, as we go to press on Thursday, and the space is generally filled by that day.

HENRY WILLIAMS.—The sky may be blocked out in various ways: a piece of thin blackened silver paper, carefully cut and attached to the negative, affords a useful mask for the purpose, and one which we prefer. 2. A saturated solution of gallic acid is the proper developer for enlarged prints. Sometimes a little acetic acid is necessary, and sometimes a drop or two of nitrate solution; but these depend upon the condition of the print, and the judgment must dictate their addition. 3. The formula we recently published as employed by Mr. Solomon is an exceedingly good one.

J. C. STEPHENS.—Decomposition has undoubtedly taken place in the silver solution. We will write.

GERMANIUS.—The second letter and duplicate draft received. The copies of the *News* have already been sent. The book in a few days. Answers to the various questions shortly, when we have had time to examine the specimens and report on the points raised.

AN AMATEUR.—There must be some exceptional element in the case. Collodio-bromide plates, in our experience, keep well. We have exposed them some weeks after preparation without perceiving any deterioration. Such a loss of sensitiveness as you state to have occurred in three days puzzles us. We believe the Liverpool Company's collodio-bromide plates keep good for months. 2. Collodio-bromide is not suitable for printing on paper in the same manner as collodio-chloride, because the image of reduced bromide is weak and grey, possessing much less vigour than the image obtained by reduced chloride. 3. We have not yet received further details.

Several Correspondents in our next.

We are again compelled to leave over until our next several important articles in type, owing to the pressure upon our pages.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 507.—May 22, 1868.

CONTENTS.

	PAGE
Mr. McLachlan's Discovery.....	241
Swan's Carbon Process.....	242
Pictorial Effect in Photography. By H. P. Robinson.....	242
On the Transformation of Photographic Images in Silver into other Metals and Combinations. By Wilhelm Grune.....	244
On the Economic Use of Artificial Light. By David Winstanley, Junr.	245
Remarks Upon the Wet Collodion Process. By Mr. McLachlan	245
Dry-plate Photography. By S. Beverley	247

	PAGE
Recent Patents	248
Instantaneous Photography a Quarter of a Century Ago	249
Proceedings of Societies—South London Photographic Society...	250
Correspondence—Mr. England's Process—Honey Process—Sulphocyanide Toning	250
Talk in the Studio	251
To Correspondents	252
Photographs Registered	252

MR. McLACHLAN'S DISCOVERY.

PENDING the three months' preparation necessary for an experimental verification of Mr. McLachlan's mode of working, a few words on his recent communication may not be out of place. His candid, outspoken manner of dealing with the whole subject; the unhesitating opinion he has expressed of the prevalent ignorance amongst photographers and the imperfect information of journals, entitle him to candid and outspoken rejoinder. Complimentary platitudes are out of place under such circumstances. They would be unfair alike to Mr. McLachlan and to photographers. It is due to both that if this gentleman be right, an ungrudging acknowledgment should be made of the fact; that if he be wrong, his error should be unhesitatingly pointed out. As we have already said, we give Mr. McLachlan credit for the most perfect honesty of intention, and not only purity, but liberality of motive. We believe him to have been an earnest, self-sacrificing experimentalist; and the effort and expence undertaken, at his own sole cost, to bring information, which he believes to be important to the progress of the art, fully and freely before his brethren, ought to entitle him to their careful attention. If he be proved to be in error, the cost and the mortification are all his; if he be right, the gain is that of the photographic community.

At the outset, however, we deny in the strongest terms the nature and extent of the ignorance and incapacity which Mr. McLachlan attributes to photographers generally and to photographic journals. On theoretical questions we admit that much remains to be determined; on practical points we admit that uncertainties at times exist, and that we should have thankfully received information which would have set aside some of the difficulties which occasionally beset the ablest men; but we deny that the majority of professional photographers of any position are groping in the darkness, or struggling with the vagaries which Mr. McLachlan so forcibly pictures, and we simply appeal to facts in reply to his allegation. Let us examine the practice of any photographer whose name and work are known. Take that of Francis Bedford. When he travelled in the suite of the Prince of Wales in the East, working the wet collodion process on large plates, under the greatest possible difficulties and disadvantages, without the power of remaining as long over each subject as he chose, without the power of revisiting the scene of any negative to repeat his operations if desirable, did he fail, or return without a good picture of any one of the important objects visited? On the contrary, he brought home, after his hurried trip, one of the most perfect collections of Eastern scenery that could be desired, charming as pictures and perfect as photographs. Whatever the difficulties, there was the practical issue. Mr. Frank Good has recently repeated a very similar task. Mr. England has for years past, in mountain and valley,

crowded street or lonely glen, worked with a precision of which the number and excellence of his published works are the best evidence. We might extend the list to include the name of every landscape photographer of position, and we especially mention these because working in tents and with travelling equipments involve difficulties little dreamt of in the studio. Then, if we were to mention the portraitists who, in daily practice, produce in regular succession any number of perfect negatives, we might fill many columns of these pages.

Mr. McLachlan's allegation as to the absence of information in the journals we might be content to pass without comment, as probably done without thought of the insult it conveyed to the gentlemen of the highest rank as chemists, artists, and practical photographers, who have from the commencement contributed the results of their study and practice to societies and journals. If the journals have been deficient in information it must be because the ablest men connected with the art are either incapable or dishonest, for there is not an illustrious name in photography which has not been attached to contributions in the journals. We are afraid that this allegation, like some others, was the offshoot of imperfect knowledge. We asked Mr. McLachlan what journals he had been in the habit of reading; and learnt that, until very recently, he had *not* been a reader of the PHOTOGRAPHIC NEWS!

We were reminded of the anecdote of a chemical student calling upon Faraday with a discovery he alleged he had made. "Have you read the published authorities on this subject?" Faraday asked. "No; believing I had made an important discovery, I did not like to waste time in consulting books," was the response. "So," responded the great philosopher, "you come to waste my time by bringing under my attention experiments which are already well-known, and published. In future, when you think you have made a discovery, before announcing it, make yourself master of what has already been published."

On the subject of uncertainty in working let us not be misunderstood: every photographer has occasional difficulties; but the more prudent the practice, the fewer the occasions, as we shall presently show. The very nature of the circumstances necessarily involves occasional uncertainty. The photographer works with materials prepared for him of the exact nature or condition of which he can never be quite certain. The soluble cotton is a material peculiarly liable to slight variations of constitution; the ether and alcohol peculiarly liable to traces of varied impurity, and peculiarly liable to change; and these, when mixed and iodized, are liable to other and complex changes dependent on conditions and time of keeping. Although pure nitrate of silver may be easily obtained, and a good bath made, that bath must—however perfect the materials, however comprehensive the knowledge employed—be constantly changing in constitution,

Silver is abstracted from it by every plate immersed, and nitrates of the base employed in the collodion and iodide of silver, as well as ether and alcohol, constantly accumulate and furnish the elements of other and complex changes. These and other elements of uncertainty exist with the purest materials and the most perfect conditions, and are inherent in the process. The wonder is, not that uncertainties exist, but that, with so many elements of change not under strict control, so much good work is done with so much precision and regularity by so many photographers.

Further, we must contend that if much greater difficulty and uncertainty existed than really does prevail, the remedies proposed by Mr. McLachlan can in no way tend to greater certainty. The basis of his proposal is the use of an impure sample of nitrate of silver, of unknown impurity, difficult to procure, and still more difficult to identify. Need the conditions of uncertainty be carried further? We need not dwell on the uncertainty involved in adding one empirical remedy to various collodions of unknown and varying constitution, nor to the uncertainty involved in using by preference sulphate of iron of unknown impurity.

We have on a former occasion remarked, we may be reminded, that assuming the facts stated to be true, they were important and interesting. This is undoubtedly true; but they do not furnish remedies for any of the inherent uncertainties of the collodion process. If it be true that a solution of nitrate of silver undergoes a change, under the prolonged action of sunlight, other than that already recognized, and that, in consequence, it acquires a property, not only of holding a large portion of oxide of silver in solution, but of preventing it being readily reduced, the fact is both interesting and important, inasmuch as, if true, it must lead to more rapid, and, possibly, more perfect results; but it affords no immunity from the constant changes going on in collodion, the constant accumulations and change of condition in the nitrate bath, the constant possibility of the action of impurities beyond the control of the photographer, and the varying other elements of change and uncertainty which are the chief sources of the troubles which occasionally beset the photographer. If the fact stated by Mr. McLachlan, that a bath treated as he describes suddenly and of its own impulse eliminates from itself excess of iodide of silver, it is very important and interesting, as getting rid, not of an uncertainty, but of a certain source of occasional defect, with less trouble than is involved in the method of diluting and filtering.

But without denying Mr. McLachlan's facts, which can only be verified or disproved after many months of careful experiment, we may point out that there are certain considerations in regard to them which require weighing. In the first place, the best evidence he could have furnished to a meeting (experiment being impossible) would have been a sight of some negatives of exceptional excellence. We know that Mr. McLachlan is a capable practical photographer, and produces fine negatives, as do most photographers of position; but the gentlemen present at the Photographic Society would not have been slow to recognize any exceptional qualities.

Further, there is already a difference of evidence on the facts. Mr. Spiller states that a bath prepared according to Mr. McLachlan's instructions, and sunned for seven weeks, was made alkaline and unfit for work by the addition of 6 drops of a 1-grain solution of caustic potash, the proportion of the alkali to the silver salt being as 1 to 56,000. Mr. McLachlan states, that instead of 6 drops, "quite a gulf" of the potash solution was added. A mistake exists somewhere, and we leave our readers to select between the precision of a gentleman of long experience as a practical chemist, accustomed to attach value to infinitesimal proportions, and that of Mr. McLachlan, who is certainly an impulsive and enthusiastic gentleman, although, as he says himself, no chemist.

And here we have a word of grave remonstrance for Mr. McLachlan, which he must take in good part, as it is written

in a friendly spirit. He prefaced his last communication by stating distinctly that he was no chemist, and he then proceeded, not simply to state the facts of his experience and observation, but to indulge in a series of theoretical speculations of the most incongruous character, and to speak of chemical reactions of the most impossible character. We forbear giving examples; but we suggest that we are prepared to listen attentively to the observations and experiences of Mr. McLachlan as those of a gentleman who has worked hard and enthusiastically in experimental photography, and whose work, guided by more chemical knowledge, would have been more valuable; but we must ask him to avoid encumbering his facts with chemical terminology misunderstood and theory misapplied, as these things materially impair the practical value of his information.

Having pointed out—with the candour for which he asks—the misconceptions which we think Mr. McLachlan has laboured under as to the existing knowledge of photography, and his somewhat erroneous estimate of the scope and bearing of the facts he has stated, we shall in our next have a few words on the real importance and value of his communication, which, notwithstanding the errors we have pointed out, contains much suggestion for which photographers will be obliged to him.

SWAN'S CARBON PROCESS.

NOTWITHSTANDING the large number of excellent carbon prints which have been issued by Mr. Swan from his establishment at Newcastle-on-Tyne, and the fine examples which have been exhibited by Mr. Mayall, Mr. Cherrill, and others, we learn from personal and written communications with photographers that a doubt exists in some quarters as to whether these things are indications of anything more than exceptional success, and whether, after all, the carbon process can be generally worked with success as a commercial enterprise.

It will interest photographers generally, and especially those who have doubted the practical character of the carbon process, to hear of the progress of this mode of printing at the establishment of M. Braun, of Dornach. It is not much more than two years, if we remember aright, since Mr. Swan's process was inaugurated at Dornach. During that time it has been gradually developed, and has displaced silver printing. The number of persons now regularly engaged in the establishment in the production of carbon prints is eighty; and the demand for the pictures is so great that, with this large staff, M. Braun finds it impossible to accumulate stock, the demand being in advance of the production. One fact like this is worth a hundred arguments on the practical and commercial character of carbon printing.

We hope ere long to see this mode of printing as extensively in use in this country. The "Autotype Company," to which we have before referred as having acquired the patent of Swan's process in this country, is steadily progressing with arrangements for an exceedingly perfect and extensive system of art reproduction by means of carbon printing, which promises more for the popularization of really good art, and giving the examples a permanent form, than has ever yet been attempted in this country. The results now exhibiting at the company's gallery in the Haymarket leave no room for doubt as to its success.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XVII.

"Every man is always present to himself, and has, therefore, little need of his own resemblance, nor can desire it but for the sake of those whom he loves, and by whom he hopes to be remembered: this use of the art is a natural and reasonable consequence of affection, and though, like other

human actions, it is often complicated with pride, yet such pride is more laudable than that by which palaces are covered with pictures that, however excellent, neither imply the owner's virtue, nor excite it. Genius is chiefly exerted in historical pictures, and the art of the painter of portraits is often lost in the obscurity of his subjects; but it is in painting as in life: what is greatest is not always best."—*Dr. Johnson.*

"Blest be the skill which thus enshrines the great,
And rescues virtue from oblivious fate,
Which seems to fix the falling stars of mind,
And still preserves their lustre to mankind."

Sir Martin Shee.

PORTRAITURE.

PHOTOGRAPHY has been employed to represent everything under the sun, and that is illuminated by his light; nay, it has gone farther than this, it has brought pictures out of the caves of the earth, where the light of heaven never enters, and where the only source of actinism has been coiled up in a wire; it has even compelled the pyramids of Egypt to give up some of their secrets, and the catacombs of Rome pictures of their dead. The earth, the sea, and the sky it delights to render; it multiplies the works of genius, whether the original vehicle has been paint or marble, or that "frozen music" of which the great architects of old piled up their marvellous temples. The pirate and the forger have called in its innocent assistance to help them in their dirty work, but for which photography has returned the compliment by assisting justice to execute the law; and so truthful does the law consider its evidence, that it is accepted as an unquestionable witness which it would be useless to cross-examine; it helps the trader to advertise his wares, it aids the astronomer to map the stars, and compels magnetism to write its own autograph; and all this in such a way as no other art has ever yet approached. But of all the uses to which it has been put to benefit and delight mankind, none can compare with its employment for portraiture, the chief object to which its inventors intended it to be applied, and for which it appears to be most thoroughly adapted.

The portrait has always been the favourite picture with the world. It is an especial favourite in England, because it appeals to the domestic sympathies; and this is the most domestic nation on earth. Johnson is reported to have said he would rather have the portrait of a dog he knew than all the historical pictures ever painted. Horace Walpole gives excellent reasons for preferring portraits to other pictures: "A landscape, however excellent in its distribution of road, and water, and buildings, leaves not one trace in the memory; historical painting is perpetually false in a variety of ways—in the costume, the grouping, the portraits—and is nothing more than fabulous painting; but a *real* portrait is truth itself, and calls up so many collateral ideas as to fill an intelligent mind more than any other species of painting."

Without disparaging other branches of art, as the author of the above sentence has done, there is no doubt of the extreme popularity of the portrait, and photography has only developed and encouraged a desire for representations of those we love, honour, or admire, by giving us the means of producing portraits, not only within the reach of the humblest purse, for their cheapness, but that we can believe in, for their truth. Before the birth of our art those who could not afford to employ a Reynolds, a Gainsborough, or a Lawrence, had to be content with the merest suggestions of likeness, executed in the most miserable style. Even when the portrait was painted by a master, it required considerable faith to enable a person who did not know the original to believe in the fidelity of the resemblance. The friends of Sir Joshua Reynolds often used to express their surprise that he had courage to send home portraits that bore so little likeness to their originals. And from his painted portraits we have nothing like the faith in the personal appearance of Shakespeare we should possess had we a portrait of him produced by photography. How are we to believe that the portraits of Lely are faithful likenesses of the ladies he painted, when they are so like each other that they appear to be one vast family of sisters? Kneller's portraits also appear like so many prints from one plate. Are we to believe that in the time of these two painters nature forgot her variety, or departed from her rule that no two men or women

should ever be the same in form, feature, colour, or proportion? This mannerism, which tended to destroy faithfulness in portraiture, injured, more or less, the works of all painters until photography came to teach them individuality.

The application of photography to portraiture has reformed and almost revolutionized that art throughout the world; yet ninety-nine out of every hundred photographic portraits are the most abominable things ever produced by any art, and the original may often truly say, with the old Scotch lady who saw her own portrait for the first time, "It's a humbling sight; it's indeed a sair sight." This is not the fault of the art itself, but of those who, on the strength of being able to dirty a piece of glass with chemicals, are pleased to dub themselves artists. The late depression in the trade has done good in one respect, if it has borne rather hardly on some: it has killed off the weak ones—those who never should have left the occupations for which only they were fit, to discredit, by their miserable productions, a noble profession; for photography is a noble profession, although it is a mean trade. Photography has hitherto been,—

"A mart where quacks of every kind resort,
The bankrupt's refuge, and the blockhead's forte."

Again, the photographer has not often the advantage, enjoyed by the painter, of making the acquaintance of his sitter before he takes the portrait. He often sees him for the first time as he enters his studio, and has done with him in a short quarter of an hour. It requires great perception of character and great fertility of resource to enable him to determine at once, and at a glance, what is best to be done, what expression he should endeavour to call up, and what position would best suit his sitter. Great painters usually commence operations by dining with their subject, the value of which is shown in the following anecdote of Sir Joshua Reynolds, related by Leslie.

A matchless picture of Miss Bowls, a beautiful, laughing child, caressing a dog, was sold a few years ago at auction, and cheaply, at a thousand guineas. The father and mother of the little girl intended that she should sit to Romney, who, at one time, more than divided the town with Reynolds. Sir George Beaumont, however, advised them to employ Sir Joshua. "But his pictures fade," said the father. "No matter," replied Sir George, "take the chance; even a faded picture, by Reynolds, will be the finest thing you can have. Ask him to dine with you, and let him become acquainted with her." The advice was taken, the little lady was placed beside the great painter at the table, where he amused her so much with tricks and stories that she thought him the most charming man in the world; and the next day was delighted to be taken to his house, where she sat down with a face full of glee, the expression of which he caught at once, and never lost; and the affair turned out every way happily, for the picture did not fade, a phenomenon occasionally met with even in photography, and has, till now, escaped alike the infictions of time or of the ignorant among cleaners.

There are two morals to this little anecdote: the one is, that if all proper means are taken to secure a good portrait, glass-plate cleaning is not the first operation. The preliminary proceeding is to dine with your sitter; the disadvantage being, that the photographer's appetite should equal the extent of his business, which is not always possible, even in the present slack times. The second moral is, that the fading of pictures did not originate with photography. Sir Joshua Reynolds' pictures were known to fade even in his lifetime, which means that it is possible for paintings in oil to deteriorate quite as quickly as photographs. It is not much consolation to the kettle to know that the pot is also black, but it is comforting to know, as we have done for the last year or two, that there is no more necessity for photographs to fade than there is for paintings.

All this by way of introduction; I shall attempt to grapple with this difficult subject—portraiture—next week.

ON THE TRANSFORMATION OF PHOTOGRAPHIC IMAGES IN SILVER INTO OTHER METALS AND COMBINATIONS; AND ON THE TECHNICAL APPLICATIONS ARISING THEREFROM.

BY WILHELM GRUNE.

I HAVE undertaken the experiments which I propose to communicate in these lines in order to make photography more practicable for industrial purposes; the good results which I got will, perhaps, induce others to undertake further experiments in this interesting and not yet sufficiently cultivated department. Where the photographer has finished the operations of his negative process, I begin my work by further chemical reactions on the silver image resulting from that process.

It is known that such an image is obtained by pouring a collodion containing iodide and bromide on a glass plate, which is immersed into a bath of nitrate of silver, afterwards exposed to light, and treated with sulphate of iron. In this process a precipitate of silver is formed on all parts which have been affected by light, whilst the iodide and bromide of silver, which have not been influenced by light, remain unchanged, and are removed by means of hyposulphite of soda or cyanide of potassium. The result of these operations is an image consisting of fine powdered metallic silver on an indifferent and transparent layer of collodion. It is a very peculiar fact that this image is not lying within the collodion, but upon it; thence follows, that it can be easily removed by the mere application of a finger and oil, without hurting the collodion. I make use of this property by transferring the inverted image on any other substance (as, for instance, wood, ivory, &c.), and removing the collodion by means of ether; the image, consisting of a very fine powder, remains on the surface employed to receive it. This process is of great importance for the manufacture of wood engravings; it removes the difficulty of drawing on wood, by which the original image is so often deformed; it is not necessary to treat the surface of the wood by itself; and in cutting no trouble arises from the process.

In the same way I get photographs totally free from fading, by transferring to paper images already converted to platina. Photographs of this kind have a very great likeness to engravings, and it is possible to get faithful reproductions of these by the indicated method.

By the expression "transferring," I mean removing the collodion film, with the image upon it, from the glass plate, and mounting it on another material, as china, paper, or other surface. This is effected by placing the glass plate, with the wet collodion on it, into water, which contains a little sulphuric acid. After a short time the film is removed from the glass, and may be cautiously transferred with a brush to any other fluid, and mounted on another support. In all operations which I propose to describe, I employ these films removed from glass; in water they remain unchanged for months.

In order to effect the chemical transformation of the image, I make use of the strong affinity which exists between silver and chlorine. The silver in the images decomposes most of the chlorides, and leads thereby to the proposed end; we can employ for this purpose such salts as are soluble in water, or other solvents, and are precipitated insoluble as pure metals or chlorides of a lower degree when they are deprived of their chlorine; I myself have employed chloride of platina, of gold, of palladium, iridium, copper, or mercury.

Chloride of silver being formed, the metals or sub-chlorides are precipitated insoluble, and, when chloride of silver has been removed by the well-known solvents, the precipitated matters remain, and form exactly the original image in all its half-tones, the substance of the latter being therefore changed.

Chloride of platinum changes the grey silver image into a dark image of platina black. If this be transferred to glass or china, covered with an enamel containing lead, and

then heated, the image burns in black. In this way I have got portraits and pictures on china and enamel for many years. If we employ a reducing flux, we receive images and drawings in the peculiar metallic colour of platina. Chloride of gold gives images of brown golden colouration, green when examined by transmitted light, which, when transferred to glass and china, and burnt in with a reducing enamel, give golden drawings, capable of receiving a metallic polish. On this principle I have based my photographic chemical method of decorating glass and china. The effects got in this way are of a very great delicacy, but do not show any half-tones, since gold, even in the greatest dilution, keeps its original colouration when it is looked upon, although it may be scarcely perceptible by looking through.

By the facility of making, by photographic operations, silver films of any thickness we please, and of transforming them into gold, it has become possible to precipitate gold as a metal in such a dilution as we have not been able to do before. More interesting than of importance for practice are—

Chloride of iridium, which gives dark grey drawings in the heat.

Chloride of palladium gives dark grey images, which very peculiarly, when burnt into china and worked upon with a polishing-stone, like generally gold and silver, show a brown colouration of metallic shine.

Chloride of mercury changes the silver images into white ones, consisting of chloride of silver and sub-chloride of mercury. When employed on photographic paper images it gives the well-known magic photographs. Such a white image placed upon a polished plate of zinc, copper, or steel, is readily decomposed by mere contact, even when dry; and when it has been removed the whole drawing remains on the plate, a circumstance which could be made use of by engravers in order to get rid of difficult delineating.

These white images are extremely sensible of hyposulphites, which they indicate still in a dilution of 1 to 600,000. They may therefore be employed as a proof of hypo, because they keep, unchanged, for a longer time under water. In a hypo bath the white image is changed into sulphide of mercury, of black colour. I employ this in order to get very nice effects on glass. If I bring such a film with a mercury image on it into water which contains enamel fluxes suspended, the spots struck by light absorb the fluxes, whilst the other parts of the collodion film remain indifferent. If this image is brought on glass into a high temperature, the sulphide of mercury is burnt away, and on the surface of the glass remains an image consisting of ground glass, and showing exactly the original drawing without any colouration.

A white image of sub-chloride of mercury treated with iodides receives a yellow colouration, iodide of mercury being formed. This is of importance for the practical photographer, if he likes to make weak negatives more intense. It is possible to work in direct sunlight with such yellow negatives, since the layers beneath are not heated so much as generally, which is of a great value for heliographic purposes.

Chloride of copper is precipitated as subchloride, which, when heated with sulphocyanide of ammonia and ferrocyanide of potash, receives a red colouration, changed into flesh-tint by being burnt in on faience and enamel.

I now give a further series of precipitations, which are of importance for the application of photography on burning into china and glass, because they enable us to produce different colours and shades by employing different fluxes. I suppose, however, that not only chemical reactions produce these colours, but that also physical properties of certain finely-divided metals have influence on the production: first of all, a red-brown precipitation, which, according to Mr. Selle, is produced by treating a silver image with a mixture of nitrate of uranium and red ferrocyanide of potash. An image transformed into platina-black gives

with the same chemicals a very agreeable brown image, which I have very often employed for making transparent photographs on white glass. A mixture of chloride of iron and ferrocyanide of potash is a brown solution: a platinum image placed into this fluid is immediately changed in a picture of Prussian blue precipitated. This is not the case with a silver image. When treated with caustic alkalis the image of Prussian blue is decomposed; platinum and oxide of iron remain. A silver image placed into a solution of permanganate of potash is immediately coloured a brownish-yellow; oxide of manganese being formed on the image.

As already stated above, these precipitations are not the only chemical ones, since there is no limit for precipitating. This circumstance affords to practice the advantage that every degree of decomposition and every tone may be got.

Great attention has been paid lately to chloride of silver, because it enables us to reproduce the natural colours by photographic means. This is especially the case with violet-chloride of silver. The production of the sensitive surface of sub-chloride of silver on silver plates or paper does not admit exact observations as to the origin of the colours, the acting film being always bound to a support, which is not quite neutral. By my method of transforming I receive, very easily, films which consist only of sub-chloride of silver supported by collodion or glass. As in the production of metallic silver images, I receive an equal surface of finely-divided silver on a glass plate by general exposure; I now change this into chloride of silver, leaving it on the collodion; or I first remove the collodion by burning, and then treat the silver directly supported by glass. As a means for transforming metallic silver into chloride of silver, I employ a mixture of diluted permanganate of soda with hydrochloric acid.

ON THE ECONOMIC USE OF ARTIFICIAL LIGHT.

BY DAVID WINSTANLEY, JUNR.

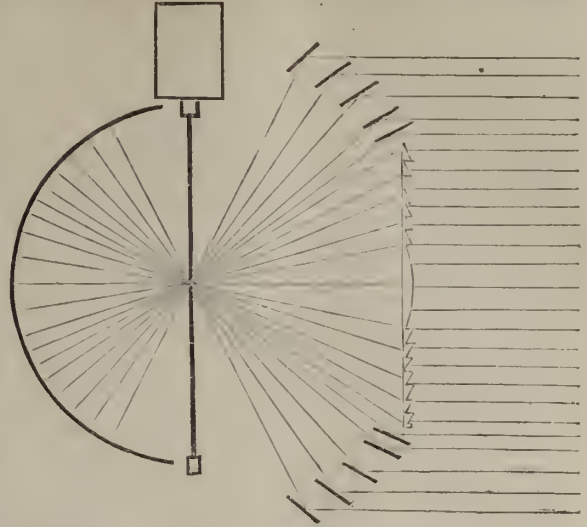
SURELY no person who has ever witnessed the production of an enlargement by the lime, the electric, or the magnesium light, can have failed to witness with regret the enormous waste of illuminative and actinic power which takes place. I believe I may venture to say that no apparatus for such purposes is in use which does not involve the very serious drawback of loss of light in most lamentable quantities.

In the use of the electric and magnesium lights, for instance, each gives illumination to the extent of 360° in the horizontal angle, and nearly the same amount in the vertical, and yet it rarely happens in either case that more of all this vast quantity of light is utilized than that which suffices to cover a circle 45° in diameter.

In the case of the lime light the loss is not so great, inasmuch as 180° horizontal and vertical is the limit of available light. By-the-by, it is worthy of notice that when the cake of lime is thus sustained in such a manner as to give a full view of the back, there is as much light given off from this back surface as would suffice to illumine a decent-sized room, or quite sufficiently for domestic purposes. In any case, however, there is a vast deal more light lost than it is desirable there should be.

In the case of the magnesium and electric lights, I am surprised that a reflector should not have been employed, even at their earlier introduction. Many have tried, and one or two even asserted that they have succeeded, for enlarging purposes, with a parabolic reflector. How such a reflector *could* succeed is certainly more than the writer can perceive, and he is tempted to think that the assertion that it *did* succeed is—to use parliamentary language—"not altogether in accordance with the strictest veracity." Had a spherical reflector been used, the case would have been different, as, by placing the light in its centre, all the rays—both reflected and original—would have the same direction of divergency, and would, therefore, be capable of being brought to the same focus by the condenser, and of forming one image instead of two.

The accompanying sketch shows an arrangement in which Fresnel's lighthouse dioptric apparatus is combined with a spherical reflector for the purpose of utilising the largest



possible quantity of the rays proceeding from the electric or magnesium light, and which appears, in the writer's estimation, as being such as may be added to the enlarging camera with great advantage from an economical point of view. Care would no doubt be required in the construction of the lens of the dioptric arrangement, in order to distribute the light in one even beam; but care is also required in the construction of a portrait combination, and, indeed, in the construction of everything from which we reasonably hope to obtain any valuable results; and if this should prove to be the only objection to this form of apparatus, we shall, I hope, shortly see it in use for the purpose of producing photographic enlargements by artificial light.

REMARKS UPON THE WET COLLODION PROCESS.

BY MR. MCLACHLAN.*

I CAN assure you that it is with great diffidence I discuss this subject before gentlemen whose knowledge of chemistry and actual performances in their profession, so completely outstrip anything I have ever done; yet my love of the art compels me, if I speak at all, to speak the truth as it is in me. I am no chemist, therefore claim your indulgence in laying the following facts before you:—

In my opinion the common process has been tried and found wanting; no experience is capable of cheekmating its vagaries; nor can it be depended upon from hour to hour. I will only touch upon some of the points, and endeavour to show the cause of its instability, as well as the errors committed in working.

To begin with the bath, we are desired to iodize it with iodide of potassium or silver; this is very indefinite, for there is a great difference in its working, according to the kind of silver used, and the way it is prepared. What is wanted, I presume, is iodide or bromo-iodide of silver with an excess of nitrate, organic matter acting as an accelerator; if this is so, it must be very important indeed to obtain the iodide in a proper condition. I think this will be admitted; if not, try the following experiments, and you will soon be convinced:—Suppose you begin with neutral silver: into an ounce measure place one drachm of 35-gr. silver solution, into another measure the equivalent proportion of iodide of potassium; mix and wash, see the kind obtained; repeat the experiment with another drachm of silver, only adding one drop of weak nitric acid, of the strength of one drachm of acid to 6 ounces of water; again observe the iodide obtained; keep repeating this experiment, and you will find every time a difference in the iodide, each addition of acid

* Read before the Photographic Society, May 12th.

making it less sensitive; reverse the experiment, and, instead of acid, drop into the silver 1 drop of caustic potash, 1 grain to an ounce of distilled water; do this five or six times, compare the iodides in appearance and working; the perfectly neutral giving by far the most certain as well as the most truthful results, the acid iodide giving thin pictures, and the alkaline giving unstable patchy ones that decompose the development. An iodide made from a concentrated silver solution will give a stronger picture than one made from a weak solution. When a bath is made, the water-bottles, &c., should be of an equal temperature, as near 60° Fahr. as possible. To prove this, take a rather acid silver, let the water be from 65° to 70°, iodize with iodide of potassium, dilute to requisite strength, and you are almost certain to have slightly streaked plates with indications of fogging. Such a bath will soon give hard pictures, especially if the precipitate of iodide has not been great; if it has, they will be even but rather more foggy; this is caused by the temperature separating the iodine from its base, free iodine causing fine streaks, the haste the fogging. Long rest or sunning will cure it of its fogging propensities. Should you add nitric acid to cure it your difficulties begin, because of it acting upon and decomposing the iodides in the collodion; for according to the state of the bath or collodion will you have one or other of the iodides described. Alkaline plates are often obtained from an acid bath, because of the collodion being made of strong alcohol and ether; the iodizer not being of the most soluble kind under such circumstances, decomposition or disturbance takes place in the plate while the iodide is forming; with an acid bath this is always so more or less. This tells me that for certainty and perfection of results, both bath and collodion should be neutral. By the common system of working this is not possible (at any rate for daily practice), but my way of preparing the bath allows this, as it gives the necessary firmness to the picture, as well as having the power to rectify any alkalinity in the collodion.

Every different kind of silver makes baths of different degrees of quality and stability, and this is not caused by any impurity, but is entirely owing to the state the crystals are in. Condition of chemicals is everything, and not—what might be supposed—actual purity. A clear, transparent, neutral, dull, and blue-looking crystal is the best of all; the semi-opaque, slightly alkaline, and white-looking, being the worst. Baths from this silver are not so lasting, nor do they generally give such clean pictures. This kind, even when perfectly neutral, is what I should call weak in constitution, and no addition of acid, however carefully added, will ever give it the same stability as the clear, deep-coloured, neutral crystal. The addition of acid helps to give it stability, but it does not answer so well as the proper crystals. The acid seems to act by itself, and to affect the collodion much more injuriously.

I will now examine the collodion, and see if it is likely to be in a proper condition for forming an iodide or bromo-iodide of silver in equivalent proportions when it is placed in the bath. For this to be possible it must be perfectly homogeneous; by that I mean there must be an atom of iodine in combination with an atom of base. This, I think, is very rarely if ever obtained, because of the action of the pyroxyline and the solvents upon the iodizer, for as much as we depart from equivalent proportions do we fail in obtaining, not only stability, but, more than all, truthfulness. Excess or separation of base gives hardness and a corresponding want of the power of rendering perfect anatomy. The free iodine, although serving to give clear pictures and reduce intensity, is constantly acting injuriously upon the bath. Neither the free iodine nor the separated base play any direct part in the formation of the image, but they are highly injurious in the nitrate bath, causing hardness and greasiness, and speedily destroying its good working qualities. Why cannot we obtain the iodizing solution undecomposed in the collodion? There are various reasons why this cannot be obtained: first, strong ether and alcohol will decompose the iodides more or less, according to their solubility; the pyroxyline that is generally used will decompose the iodides more or less, and so will the acidity or alkalinity of the solvents cause a precipitate of the iodides or the bromides, as the case may be. I shall, no doubt, be told that pyroxyline can be made that will not decompose the sensitizer. Of this I am aware; but it will often do worse in many ways not possible to be explained in this article. Very soluble iodides can also be used, but they give thin pictures; for remember, it is the state of solution of the iodide that is everything, and not the kind of iodide. Condition is everything; the more acid collodion is, the

more unstable it is as a rule. Now, the effect of introducing into the ordinary nitrate bath a collodion with a part of the base of the iodide free is to produce an iodide of silver in the wrong condition. According to the state of solution in which the iodide is in the collodion, so will the picture be flat, hard, or round; but it cannot be truthful, although it may be sometimes more pleasing than if it was so, hard features being favoured by an iodide that is easily soluble. Pyroxyline I will say nothing of, as the varieties are so numerous that I should only waste time by alluding to any; yet it is of more importance to photographers to thoroughly understand their different actions in collodion than is generally imagined. There is a revolution that will come from pyroxyline as great as any that I claim for my bath. When this is accomplished, as it will be, failures will no more be known but through carelessness, and never, until it is, can we have an iodide of silver in a perfect state.

There is now the iron solution, or developer. Nothing I have ever read has given me an insight into its different states or conditions; it has always been so many grains protosulphide, as if it was always of the same kind, any more than collodion is; I refer to the protosulphide alone, without the many additions it has from time to time been subjected to. There are just as many kinds of iron as there are of silver or collodion, and all guaranteed to be pure; and I have no doubt they are; for although there ought to be nothing easier than to obtain a definite pure crystal of iron, yet it is not so easy: for unless you purchase a lot at once, every different sample will produce a difference in the negatives. I will describe some different kinds:—No. 1 is a deep green crystal, dissolves quite clear, and keeps so for a whole day and night without the addition of any alcohol or acid. No. 2 is less deep in colour, dissolves clear, and keeps clear perhaps for a half-day. No. 3 is much lighter in colour; this is said to be absolutely pure; after it is dissolved it gets slightly muddy in about ten minutes. No. 4, common green copras, impure, at 1d. per lb., and such as is used by dyers, goes quite muddy even while it is dissolving. There are many other kinds of iron; but these are sufficient for illustration, every one wanting different treatment in its preparation; for every one of them is invaluable when its special qualities are known. Take No. 1, 15-gr. iron to 1 oz. water, to 16 ozs. of which add 5 drms. alcohol, pure spirit, and 3-2 drms. glacial acid; try to develop, and you will find that it will not flow evenly over the plate; No. 2, and the same until you come to the slightly muddy one, the pale-blue crystal pure iron; this will go evenly over. But see what a difference in their action: the iron that dissolves clear will give you a clear picture, but thin, because of the silver being washed away; the iron next in clearness, when dissolved, will give a more intense picture, principally because of its remaining more even on the plate; and those that dissolve milky, or become so after a short time, will give thin foggy pictures.

Now try an experiment: take any that keeps clear, dissolve in the same amount of water, add pure spirit, place the bottle in a saucepan on the fire with something to keep it from the bottom of the pan, fix the stopper loose, boil as long as you please (say for an hour or more); do this only for an experiment. Now, if you do not turn the neck of the bottle up the chimney before you take out the stopper, you will have the contents in your face.

The iron that dissolves next in clearness will be less liable to do this, and so on until you come to the kind that dissolves milky. With them there is no expansion of the alcohol at any consequence. How is this? Just because of the first samples of iron having more acid in them than the others, the alcohol being neutral, or perhaps slightly acid from ngo; in this state it will not amalgamate with an iron salt containing a trace of free acid.

Take the weak potash solution which is used for the collodion, drop two or three drops into the alcohol, add this to plain iron solution; now boil as much as you like; the alcohol, being homogeneous with the water, will not be separated; before they were merely mechanically combined, and, when placed upon the plate, naturally parted; now they will lay even. The iron salts that dissolve clear do not need to be decomposed by heat to prepare them for developing; and they will give the most dense pictures. About ten minutes' boiling will make the picture develop still more densely. Very long boiling (say one hour) will give you a very thin picture, but particularly clear. In a word, the irons that dissolve clear have more developing power; the muddy ones less, and so give much more half-tone. All the irons that dissolve the least

muddy, or get so after standing half an hour or so, should have the alcohol put to them, and heated more or less; when the iron is heated with alcohol, add the acid, after short boiling (say five minutes) gives most half-tone; up to half an hour, more vigour. The common iron used by dyers, when very slightly heated, just enough to slightly peroxidize part of it, gives by far the most half-tone of any, and is quite invaluable when your pictures are at all hard; your materials must, indeed, be in a bad condition if you cannot get perfect softness with this iron. This difference consists entirely in the different normal power of each iron to absorb oxygen, very much more than upon its preparation; by that I mean the number of grains used, or the amount of acid. Of course their action is varied according to strength; but it is the particular developing power of the iron that is wanted to suit the state of the collodion and bath. Nearly as much change can be made in the character of the picture, according to the kind of iron used, as there is in the collodion; this is quite irrespective of the number of grains or amount of acid. It is highly important to suit the developing power of the iron to the state of bath and collodion; for if it develops too quick for the collodion, the pictures will be hard. Every kind of iron can be kept ready by having small bottles quite full, with good corks; in this way it will keep indefinitely. Mix the two extreme irons according to the result required. Iron solution left to peroxidize is not near so good as when it is made at once by heat. If a bottle full of perfectly plain protosulphate of iron be put in the light, although the stopper is quite air-tight, and no seeming change takes place in it, yet, after having been in the light for a month, when the glacial acid is added to it, it will instantly absorb oxygen, and completely fail to develop a picture worth anything. When methylated alcohol is used for the development, it is often in itself alkaline, therefore needs no alkali added to it.

(To be continued.)

DRY-PLATE PHOTOGRAPHY.

BY S. BEVERLEY.*

HAVING promised you a paper on dry-plate photography, you may naturally expect to hear something of the different dry processes in general use; but I may as well confess at the outset that my experience with dry plates has been confined to the collodio-albumen process (England's method). I have, however, no doubt that any of the recognized dry processes will do quite as well; but for the same reason that some of you prefer the wet process to the dry (because you are used to it), I prefer England's method to any other for out-door work, and I would advise those of you who intend to try dry plates to consider which is the simplest and the best, and then get every requisite for that process before you begin. Prepare the plates carefully, being sure you omit nothing. You should, before exposing, let the plates be thoroughly dry, or they are sure to develop unevenly, and you might blame the process. I believe that many persons give up dry plates on account of the failures they have at the commencement, through nothing but lack of patience. Being used to taking a negative in ten minutes, from coating the plate to finishing, they do not know how to wait until a plate dries; on having done so, they hurry through the development, make their pictures hard, and then complain that they cannot get the same harmony, the same softness, combined with brilliance and vigour, that they can with wet plates. We should be inclined to ask: Why not? If you under-expose or under-develop a wet plate, you get a hard picture, or one without detail, or both; you can get nothing worse with dry plates. If you very much over-expose and over-develop a wet plate, you do not get brilliant prints; it is only the same with dry plates; and as the development of dry plates is slower and more under control than wet-plate development is, if a person fails with dry plates he is more at fault than if he fails with wet plates. Patience is a virtue that every photographer must possess, and if any of you should fail to get good results when commencing dry plates, please remember, or try to do so, the numberless

times you failed when commencing with wet plates; and I can assure you, if you persevere, you are sure to succeed.

The out-door photographer who works with wet plates has to contend with many difficulties. Landscape scenery does not come to him to be photographed; he must go where it is; and in doing so he must take his traps with him, which, to say the least, is enough to spoil the pleasure of a day out. And this is not all. Arrived at the scene of action, he has sometimes to go a quarter of a mile for water to wash his plates, and more if he fixes up his tent on the road, which is often the case, on account of the difficulty he finds in getting into out-of-the-way places with so much luggage. He is perpetually annoyed with dust, and, what is worse, plenty of prying people, who congregate about anything they do not understand; and any body who has tried it knows how seldom they can get a view without some one wishing to improve it by standing gazing into the camera, and that such an acquisition to the view does improve it who can doubt? Again, the difficulty in removing from one place to another is so great that the wet-plate photographer often carries camera and stand two or three hundred yards around his tent, returning each time to develop his plates, the result being that he returns home thoroughly exhausted, and often with little success.

Let us now accompany two ardent photographers into the country. They are going together for a day's pleasure. The weather is beautiful. What a lovely change from working in the operating room, on a hot summer's day, to a ramble in the country, where they can, for one day at least, inhale the pure country air, instead of the poisonous fumes of the smoky town! Both have with them their apparatus. One carries a tripod in one hand and a small parcel in the other, and walks along as though he were empty-handed; the other carries in one hand a parcel (or, rather, a large box, containing camera, chemicals, &c.), in the other, and also suspended by a strap round his neck, a still larger box. Their journey is about three miles, and as they cannot go by rail, of course they must walk. The first mile or so is got over pretty easily, and the man carries his luggage and complains not; nay, he thinks he can manage very nicely. His parcels are not over heavy, but as they near their destination he begins to think the weight increases. They arrive at last, however, and pick out a view, agree upon a place of meeting, in time to return home.

The dry-plate man has exposed a plate before the wet-plate man has cleaned his first plate, and, if he has plates enough with him, can take two views for the wet-plate man's one the day through. I will not dwell upon the difficulties experienced by the wet-plate man, as most of you are aware of them; let it suffice that he meets the dry-plate man, who has exposed his plates with little or no trouble, and has enjoyed himself amazingly. When they are returning home they meet a friend, who desires to know how far he has carried those things. "Not far," says the wet-plate man; "only about four miles, and two to go." The friend jogs along, and the wet-plate man hears, floating along the breeze, the lovely words, "Britons never shall be slaves!"

Many of you may say you are aware that it is less work to take landscape scenery with dry plates than with wet; but you know not until you return home what you have got. But I tell you a person accustomed to dry-plate work knows, when he has exposed his plates, what sort of pictures he will have; he has seen the view he wants on his ground glass, exposed his plate, and takes it home with as much confidence as if it were already developed.

The formula I use is the one given by Mr. England, or near it; you have all seen it in some of the photographic papers or YEAR-BOOK. But, to remind you of it, I will here state it:—Pour collodion on a clean plate, and sensitize in a 30-grain bath, as for wet plates, then wash until all greasiness disappears; next pour on a solution of albumen containing a few drops of liquid-ammonia; let it flow over the plate like collodion, and return to the bottle. Repeat this two or three times; wash moderately. Now carefully pour

* Read before the Oldham Photographic Society, April 30th.

over the plate a 20-grain solution of nitrate of silver containing a few drops of acetic acid to one ounce of solution. Let this stay on a few seconds; pour off into another bottle: this must not be used over again. This is the backbone of the process, as every plate gets the benefit of a new bath, and is thereby equally good. After this the plate only wants thoroughly washing, and you have a plate which, when dry, is capable of producing the best results (equal to wet plates), and should it fail, the development or exposure is to blame. To develop, pour on a 3-grain solution of pyrogalllic acid, and, when the picture is faintly but thoroughly out, intensify in the usual manner with pyro and silver; fix with hypo of soda. I never use distilled water for any of the washings, but use it for silver baths and pyro for developing solutions.

I think nothing more need be said in favour of this process than that Mr. England uses it in preference to the wet.

Recent Patents.

PRODUCING TRANSPARENT DESIGNS ON PAPER.

BY WALTER B. WOODBURY AND R. H. ASHTON.

THE object of this invention, which is simply one of the variously ramified applications of the photo-relief printing process, is to produce by pressure on paper, with a relief photographically obtained, designs resembling the ordinary water-mark, with the object of preventing forgery in bank notes, cheques, &c. The method is also applicable for producing images on lithographic stones, by placing thin paper charged with a greasy substance between the relief and a lithographic stone. The operations are described in the specification as follows:—

In carrying out our invention a relief is first obtained in gelatine by the process described in the specification of letters patent granted to Walter Bentley Woodbury, and dated 23rd September, 1864, No. 2338, or by any other analogous means. This relief is mounted or laid on a plate of hard metal, and the paper to be impressed is rolled or passed through a press in contact therewith, by which means the paper will be rendered transparent at those parts where it has been pressed in contact with the relief parts of the design. On looking at the paper by reflected light a positive picture will be seen (the transparent parts appearing darker than the surface), but upon viewing the same by transmitted light it will appear as a negative; if the reverse effect be desired it will be necessary to replace the ordinary negative by a transparent positive in the production of the gelatine relief; or a metal relief or intaglio may be obtained from the gelatine (by pressure or by the electrolytic process) and used with the ordinary paper machinery for producing the water-mark. Either line subjects or those bearing half-tints may be thus impressed on the paper; in the latter case the different amounts of pressure given to the paper by the varying heights of the relief will produce the effect of the middle tints as well as the extremes of light and shade. In place of using the relief direct as obtained to produce the water-mark in the paper, a reverse of this relief may be obtained by means already known, and a number of casts of it may be made in gelatine on the surface of a steel or zinc plate, and when dry these plates may be used for pressing the paper, or a sheet of highly pressed paper may take the place of the steel or zinc plates. Where the reliefs obtained by light are used, having for their support collodion, these may be cut to any shape, and mounted on the zinc or copper plate by means of india-rubber or other varnish or cement. It will be evident that if (while the paper is undergoing pressure in contact with the gelatine relief) a piece of fine paper charged with a coloured greasy material similar to the carbonized paper used for copying letters is interposed between the relief and the sheet of unsized paper, a design bearing half-tones, according to the variations of the relief, will be impressed upon the latter, which may be transferred to stone, and used to print lithographic impressions in the ordinary manner; or the image may by the same means be impressed at once on the stone without transferring.

Having now described the nature and object of our said invention for "Improved Means of Producing Designs upon Paper," together with the manner in which the same is to be or may be performed or carried into practical effect, we would remark in conclusion that we claim as our invention the peculiar method hereinbefore described of producing transparent designs or water-marks upon paper from reliefs or intaglios obtained by the aid of photography, and also of producing by the same means (with the interposition of paper charged with a greasy substance) of designs either directly upon stone, or which may be transferred on to stone for printing by the ordinary lithographic process.

PRODUCING PRINTING SURFACES.

BY A. A. DISDERI.

THIS process, for which M. Disderi received provisional protection, is not very fully stated, as the patent was not completed. The provisional specification is as follows:—

This invention comprises two distinct features: first, the transformation of a photographic image into a matrix obtained by galvanoplasty; and, secondly, the production with this matrix either of impressions with inks or of any colour upon paper, textile fabric, glass, ceramic ware, wood, stone, and metal, or of counter-types in relief or in intaglio on any metal, or of engraved blocks for printing.

The invention consists—1st. In obtaining by means of a vehicle (say albumen, gelatine, or other analogous body) a coating or layer containing salts which modify under the action of luminous rays, such as nitrates, chlorides, bichromates, prussiates, and the like, double salts of different metals, gold, silver, copper, and the like. The said coating or layer gives a proof in relief by causing to dissolve, according to its nature, the parts not impressioned by light, by means of water at different temperatures, alcohol, ether, or acids, and thus leaving bare the parts gradually metallized. This coating, or layer, obtained in relief after the mode of an ordinary photographic negative, will give a positive proof by transparency with the blackest lines in relief and the whitest in intaglio.

2nd. In varnishing the contour of the glass bearing this positive proof with gutta percha, in order to avoid damage; in then employing the means ordinarily adopted in galvanoplasty in order to cause a deposit upon this image of a layer of gold, silver, copper, or other metal, and to obtain thus a matrix, the hollows of which will be formed by the black or dark parts and the relief by the white or light parts. The production of this matrix constitutes the first part of this invention. Now with the matrix I can obtain various artistic and industrial results, which constitute the second part of the invention.

Firstly, I can cover this matrix with an ink at the ordinary temperature, and apply it to printing upon glass, wood, stuffs, porcelain, paper, and other bodies. Dessication takes place; then, to detach the image easily from the matrix, and to leave it adherent to the body applied to receive the impression, I heat the matrix gently with a spirit lamp. I compound the ink by mixing therewith ingredients which melt under heat, such as gelatine and the like, and colouring ingredients to vary the effects; I also add vitrifiable matters if I wish to print on porcelain and to obtain enamels and the like. Finally, I can, by the process above-described, produce impressions on wood, metals, paper, glass, stuff, stone, plastic substances, and other surfaces.

Secondly, I can submit the matrix to a second galvanic operation to obtain proofs in relief in gold, silver, copper, or other metals, which, besides appearance, will give results the most favourable to great preservation. These proofs can also, by the known typographic processes, serve for printing, as with engravings in wood or metal.

PORTABLE APPARATUS FOR THE FIELD.

BY HENRY COOK.

THIS portable laboratory or apparatus for working wet plates in the field was only provisionally protected. The specification is as follows:—

The photographic apparatus which forms the subject of the present invention has for its object the construction of a convenient form of portable apparatus for taking views without the necessity of carrying about a cumbersome and unwieldy quantity of apparatus.

The apparatus is composed of two main parts, consisting, firstly, of a circular box 6 inches in diameter and 2½ inches in thickness, constructed to contain fifty or any other convenient number of prepared and sensitized glasses, each 1½ inches square. These glasses are brought by means of the simple rotation of the case one after another directly over a door which opens and shuts automatically.

The second part of the invention consists of the photographic apparatus or camera itself, which forms the principal part of the invention. This apparatus is of the form, dimensions, and appearance of an ordinary opera glass. The glass plates used in the camera are exquisitely sensitive, and will keep so for twelve months, and the images taken may be developed at any interval after exposure. The two tubes of the opera glass are furnished with two lenses exactly similar in focus; one of these serves to project the image to be taken on to the ground focussing glass which occupies the large part of the tube, the other to produce the image on the prepared glass plate, which occupies a small dark chamber formed in the opposite tube. The circular box in which are arranged the prepared glass plates is pushed over an opening in this chamber provided with appropriate grooves; the doors of the box and of the dark chamber are simultaneously opened, and a prepared glass plate falls from the box into the dark chamber. When the view has been taken the apparatus is turned upside down, and the glass plate which has been exposed will fall back into its place in the box, which is then removed. The door of this latter closes, and a small movement to the right or left brings another prepared glass plate over the door and the opening in the camera. As the place of each prepared glass plate is numbered, all danger of using a glass twice over is avoided. The tube which contains the ground focussing glass is provided with a magnifying power to facilitate the finding of the focus; that which contains the dark chamber is provided with a spring and screw to hold the prepared glass in its place; this tube is likewise furnished with a very convenient stop or blind, which, when the instrument is fixed and the focus found, may be opened and closed according to the time of exposure. When all the prepared glass plates in the box have been exposed they may be removed in artificial light and placed in the supply box, from which an equivalent number of fresh glasses may be taken. Within the space or size, therefore, of an opera glass, a drinking cup, and a pistol case for extra glasses, a man may take and bring home with him two or three thousand views. If he be a photographer he will develop the views himself; if not, he will give them to a professional man, who for a trifling expense will complete and enlarge them for him. So great is the facility of enlargement, and so perfect are the results, that it is quite an undecided question whether it would not be wiser in all cases to adopt the system of taking small views. A very perfect stand has been devised uniting the requisite rigidity with great lightness; it is a simple socket and upright post provided with an universal joint of great simplicity, which permits of the rapid fixing and removal of the instrument.

METHOD OF ENLARGING.

BY JAMES SIMPSON.

This method of enlarging, or rather the arrangement of apparatus for carrying it out was only provisionally protected. The specification is as follows:—

My invention is designed for the purpose of facilitating the process of obtaining enlarged photographic pictures from small negatives, and also for producing from such negative a superior positive print than is obtained with the process now adopted: and the improvements consist in the employment and use of an ordinary photographic camera and lens in connection with an elongated conical dark tube or other shaped box, which may be constructed of one given length or arranged telescopically in order that it may be diminished or elongated in length. The camera or cameras are connected with the dark box so as to have the lens enclosed and embraced by the narrow end of the cone, or inserted in one side of the box, the opposite end or base being provided and enclosed with a slide or slides constructed like the ordinary dark slide of a camera, in order that it can receive a sheet of paper or other material having a previously prepared sensitized surface; the ordinary dark slide of the camera at the reverse end and outside the conical box is arranged so as to receive the negative to be printed from,

which thereby becomes the only medium through which the light entering the box will be allowed to penetrate, the rays of light so entering the box being diffused and governed according to the opacity or transparency of the negative, become in their passage through the lens gradually enlarged until they strike upon and are received by the previously sensitized surface placed at the base of the cone, the result of which is a direct enlarged positive print, the depth or intensity of which is regulated according to the time the sensitized surface is exposed to the action of light through the negative and lens. The conical dark box is provided with sliding doors, one near the adjusting screw of the lens, and the other for the operator to look through, in order that the greatest nicety of focus may be obtained before exposing the sensitized surface, the doors being closed before such exposure.

INSTANTANEOUS PHOTOGRAPHY A QUARTER OF A CENTURY AGO.

A DESCRIPTION of instantaneous photographic portraiture upwards of a quarter of a century ago seems at first sight somewhat startling, and might lead to the question, Have we really progressed? A little reflection would, however, leave little doubt on that subject, but would not deprive of interest an account of the operations in a photographic portraitist's establishment six-and-twenty years ago. A correspondent has called our attention to the following extract from the *Spectator* of April 16th, 1842, describing the late Mr. Claudet's operations at the Adelaide Gallery when photography itself was a novelty and a wonder.

It seemed sufficiently wonderful to have one's "portrait in little" limned by the sun in a few seconds, but now it is done instantaneously; a passing expression is transferred to a plate, and the "Cynthia of the minute"—or rather of the *moment*—is caught and clapped into a case in no time. This magical celerity in taking photographic likenesses by the Daguerreotype, at the Adelaide Gallery, is the result of some improvement in the process recently made by M. Claudet, who has also greatly improved the pictorial effect of the miniatures by the introduction of backgrounds, and he adopts a method of fixing the image peculiar to himself. The momentary quickness with which the likeness is taken prevents the necessity for retaining a fixed look and posture for a certain time; this is not only more agreeable to the sitter, but gives a life-like ease and vivacity to the photographic portraits: thus, the objections made to their stern and gloomy expression are obviated in a great degree, the most transient smile being reflected in the polished surface of the plate as in a mirror. The addition of a background of trees, architecture, or a library, takes away from the metallic effect of the plate, and gives to the miniature the appearance of an exquisitely finished mezzotint engraving seen through the wrong end of an opera glass. This addition is made by simply placing a scene, painted in distemper in neutral tint, behind the sitter, and arranging the focus of the lens of the camera so that the upper part of the figure is shown. By diminishing the size of the head, the defects arising from an exaggeration of facial peculiarities are got rid of, and the salient points of the physiognomy are, as it were, concentrated; the fixing process, too, imparts a warm brownish tinge to the miniature, substituting the tone of a sepia drawing for the livid coldness of the metallic surface. The roof of the Adelaide Gallery is the scene of these operations, on which a chamber glazed with blue glass is erected for use in cold and rainy weather. When it is fine the sitter is placed in the open air under an awning to screen the face from the glare of sunlight. Waiting your turn, and whiling away the time by trying to discern distant objects through the smoke, or looking at the steeple of St. Martin's Church that rises in bold relief before you, a courteous person invites your attention to a little square box that he holds, and, placing it on a stand directly opposite to you, begs you to remain steady for an instant. He lifts up the little dark curtain that veils one side of the cube-shaped box, and lets it drop directly. You suppose there is something wrong. Not at all; the thing is done. Whatever your look was at that moment it is transfixed on the plate, and you may go to the little laboratory where the process of "fixing" is performed, and, as the moisture of the preparation is evaporated from the surface, see what was the precise expression on your

face at the time. There is your image as though a diminishing glass had perpetuated the reflection, only without colour. But what a hand! Surely you have not got such a huge fist? No; you happened to thrust it forward before the plane of the picture, and hence it has been taken under a different angle. You don't like to present a portrait with such a fist to the fair one to whom you have offered your hand, and you hesitate, though the likeness is so striking. M. Claudet perceives your embarrassment, and, anticipating the objection, says: "Let us try again, if you please;" and the operation is repeated—ay, and a third time, if any accidental failure renders it necessary. Should you prefer it, a friend may share the operation, and, at the same moment, both phizzes will be transferred to the plate. We saw a loving couple taken in this way—nay, even groups of three; you may have a whole family enclosed in a couple of miniatures. The small size of the heads does not diminish the likeness; you might have a set of shirt-studs ornamented with portraits of your friends.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held in the City of London College on the evening of Thursday, May 14th, Mr. T. SEBASTIAN DAVIS in the chair.

The minutes of a previous meeting were read and confirmed.

Mr. HENDERSON exhibited some exceedingly fine enamels which he had produced by a process which he has recently discovered. The results were exceedingly fine.

Mr. WHARTON SIMPSON exhibited some examples of Marion's "Vitrified India-Rubber Sheet," which he explained did not, on examination, appear to be india-rubber. It was, most probably, made in the same way as Herr Grune's "leather collodion," made from collodion containing castor oil. He also exhibited some of a similar pellicle made by Mr. Woodbury, which was at the same time treated with iodized collodion, excited, and a preservative applied, forming, in fact, a dry collodion plate without glass. He also showed a negative produced on such a dry plate.

After some conversation on the subject,

The CHAIRMAN called attention to some fine examples of Mr. Rejlander's photography, consisting of the seven studies taken when he was producing the negative from which the presentation print of the Society, "A Night in London," was printed. It illustrated that in working out a good idea several attempts might be necessary before the highest result could be obtained. He also called attention to three charming studies from life by Mr. Rejlander, one of which was an admirable head, after the style of Guido's Beatrice Cenci.

No paper having been provided, in response to the Chairman's invitation to any member to introduce a subject of conversation,

Mr. Rejlander said he had often seen articles in which the advantages of clear glass in the shadows of a negative were claimed. He thought there was danger in aiming at this, unless much judgment were used. In a portrait with a dark background, it was a good rule to avoid having the deepest shadows in the figure as deep as the background, whilst with a light background they must of course be deeper. The effect of the shadows, being holes in which you could look through and see the background, should be carefully avoided. A negative with all the shadows represented by bare glass would not possess much gradation; a good picture should only have a very sparing amount of pure black or white.

A desultory conversation on the subject followed, and on the question whether a picture was better for the entire absence of any points of pure white. After which,

Mr. SIMPSON showed a number of Mons. Adam-Salomon's prints unmounted or finished in any way, to illustrate the amount of touching in the finished prints. They were much admired, and a general acknowledgment was made that touching was rarely needed, the photography being exceedingly perfect, and the pictures singularly full of half-tone and modelling.

The CHAIRMAN announced that the presentation print would be ready for issue at the next meeting.

The proceedings then terminated.

Correspondence.

MR. ENGLAND'S PROCESS.

SIR,—While perusing a recent number of one of the journals I was surprised to find that the application of nitrate of silver as a sensitizer to the coltodio-albumen film was attributed to Mr. England. This, sir, is not correct; for that fact was discovered by me in the summer of 1858, and the process laid before the North London Society on the 26th of June in the same year, and subsequently embodied in a paper which I read before the London Society, at King's College, on the 4th of December, 1860.

Now, sir, I do not wish in the least to charge Mr. England with taking to himself that which he believes to be another's; and therefore the only reason I can assign for so old a photographer not knowing that such a process did exist is, that while Mr. England gave his mind entirely to wet-plate photography, myself and others were engaged in endeavouring to discover a dry plate process available in the field, and certain in its results.

One word with regard to the keeping properties of the plate. If you finish it at once, the sooner it is exposed the better; but I would recommend that the film should be allowed to dry after the albumen has been washed off; because, in this state, it will keep any length of time, and it can be rendered sensitive at any time by redipping in the nitrate bath, or a solution of nitrate of silver poured over the plate, taking care to well wash afterwards.—I am sir, yours, &c., J. RYLEY, M.D.

48, Gibson Square, Islington, May 14, 1868.

HONEY PROCESS.

DEAR SIR,—For the benefit of your readers who may not have seen the early numbers of the PHOTOGRAPHIC NEWS, I repeat the process, strongly recommending it to keep for any time within six or eight hours. When your plate is ready for the carrier, pour over it a solution of honey; pour off; again pour on from the opposite corner a fresh quantity. The second lot may be used for the first coating of next plate. Exposure not more than three to four seconds more than the wet plate. Develop with either iron or pyro (caution: beware of too much intensity in the sky). Flood the plate with developer. When detail is nearly out, add 2 to 3 m. of silver solution, wash, fix hypo, wash. To make the honey solution, buy the country honey, which in season may be purchased from 10d. to 1s. 4d per lb. Take 1 ounce by weight, add 2 ounces of distilled water, filter through cotton wool, neutralize with drops of a 10-m. solution of liquor ammonia. When neutral, add 1 or 2 m. of a 10-m. solution of nitric acid.

I believe the whole secret of the process lies in neutralizing and acidifying the honey, to get good clear results. If for keeping longer, wash the plates after they come from the bath before applying the honey, and report progress.—Yours respectfully, S.

SULPHOCYANIDE TONING.

DEAR SIR,—I have for some time used the sulphocyanide of ammonium for toning, but from the first three or four lots of prints I toned in that way I perceive, that with all its advantages (and they are many), one great objection was the tendency they had to lose their purity in the whites. In some few cases, of course, this effect is an improvement; but in prints from negatives which have those delicate half-tones that all photographs ought to have, it deteriorates much from their beauty if the whites are not pure. To obtain my prints free from that defect, I wash them in the ordinary way, and then put them for a few minutes—or until I see them clear in the whites—into the following bath:—

Acetate of soda	...	...	...	4 drachms
Carbonate of soda	...	...	...	10 grains
Water...	...	...	...	20 ounces
Chloride of gold	...	...	...	2 grains.

After taking them from this bath, just give them one wash, and proceed in the ordinary way with the sulphocyanide.

I enclose two prints from the same negative—one toned with the sulpho bath only, and the other in the way I have described.

I would like to have your opinion of that.—I am, dear sir, yours truly,

GEORGE H. BRITTON.

10, High Street, Forest Hill, S.E.

[The tone of both prints is good, but that treated as above is purest in the whites.—Ed.]

Talk in the Studio.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—The prize list for the exhibition of the Society to be held this year is just issued. In photography the following prizes are offered to professional photographers:—For the best landscape, a silver medal; for the best portrait or group, a silver medal; for the second best landscape, a bronze medal; for the second best portrait or group, a bronze medal. Medals and prizes will be awarded to meritorious productions contributed by amateurs. In all cases the prints must be untouched; and of vignetted pictures, fully printed copies must also be sent for the inspection of the judges. All articles intended for exhibition should be sent to the Polytechnic Hall at Falmouth, not later than the 21st of September. Photographers desiring further information should communicate with Mr. J. C. Stephens, Falmouth.

MORE PIRACY.—A few days ago at Lambeth, Mr. Woolrych heard a number of summonses, taken out at the instance of Mr. Graves against Mr. Prince, a dealer in photographs, carrying on business in Holborn, and residing at Caroline Cottages, Brixton, for selling a number of photographs of which the complainant had the copyright. There were twenty-one alleged offences, and the penalties, at £10, would amount to £210. Mr. Lewis, Jun. (Lewis and Lewis), appeared in support of the summonses, and Mr. Brandt, barrister, was for the defendant. Several cases were taken. The evidence of Emil Kaltenbrunn, a German, in the employ of Mr. Graves, was to the effect that he went on several occasions to the defendant's place of business in Holborn and selected photographs from a bundle handed to him by the clerk. Mr. Boydell Graves, son of the complainant, stated that some years ago he went to the defendant's place of business, and when he came in he was recognized, and threatened to be kicked downstairs if he did not leave the place. Mr. H. Graves produced the certificates of registration. Mr. Brandt took several objections in the course of the discussion. The learned counsel said that under the Act of Parliament the penalties would amount to a large sum, and he urged that each case should be strictly proved. Mr. Graves said that many of the photographs were made in Berlin and Birmingham. Mr. Woolrych, after hearing a number of the cases, said the case was far too important for him to decide without consideration. He would consider the points urged, and the construction of the Acts of Parliament. His present impression was that the case had been established, but he would, before he gave his judgment, consider all the objections taken. As he was going to leave town for some time the case must stand over. Mr. Lewis mentioned that the Act required the penalties to be recovered within six months from the time of the offence, and several of the summonses were for offences committed in December last. Mr. Woolrych said he would give judgment on Saturday. Mr. Lewis asked for bail to be given for the defendant's appearance. Mr. Brandt objected. The defendant had appeared, and would appear again. The magistrate required bail from the defendant in £100, and his own recognizance in £200 for his appearance. On Saturday the case was further heard, the defence being conducted by Mr. Seaman, solicitor; Mr. George Lewis, Jun., again attended for Mr. Graves. Several further cases were brought forward, after which Mr. Woolrych said he had considered the objection urged and the construction of the Acts of Parliament, and was clearly of opinion that the offences had been established against the defendant. The first case was "Ordered on Foreign Service." The wrongful act of selling the photographs was made out, and he inflicted a penalty of £5 with costs, or the alternative of fourteen days' imprisonment. It was, in his opinion, a most daring and audacious infringement of a copyright which belonged to Mr. Graves, who had made large and liberal outlays to produce beautiful works of art, and was entitled to all the protection that the law afforded. Mr. Seaman reminded the learned magistrate that several purchases were

made on the same day. Mr. Woolrych said the Court of Queen's Bench had decided that each purchase, notwithstanding it was made on the same day, was an offence, and he should inflict the penalty in each. Then as to the photographs "Waiting for the Verdict," and "The Acquittal," the penalties would be the same, as also on "My First Sermon"—they were all spurious copies. As to the photographs "Morning before the Battle" and the "Evening after the Battle," he should award a similar penalty or fourteen days. The photographs of "Piper and Pair of Nutcrackers" would follow the same rule, as also "Home and its Treasures." There were nineteen convictions of £5 each, it would appear, or fourteen days' consecutive imprisonment on each, making some months. Mr. Lewis said he would not press for costs. Mr. Seaman said the object was to bring the matter under the Small Penalties Act, which he submitted did not apply. The penalties were ordered without costs. The defendant was locked up in default of the payment of then nineteen penalties.

PHOTOGRAPHY IN ABYSSINIA.—The photographs taken by the Abyssinian expedition which have hitherto come under our attention have not hitherto, with the exception of some large groups, consisted of portraits. Speaking of Theodore, one correspondent observes: "Mr. Holmes, of the British Museum, has taken an exceedingly good likeness of the dead monarch; indeed, I do not know that I ever saw a more striking resemblance. The engineers have also taken a photograph of him." The correspondent of the *Times* says: "Some facetious fellow-captive, with a curious quaver, however, in his voice, which makes the facetiousness give forth an uncertain sound, has just sternly ordered the ladies to come with their husbands and children, and 'have their heads taken off,' in a photograph, and, of course, I must presently go too, to have my first good look at so interesting a group, this being about the fiftieth interruption since I began this morning to try to make mental notes of what I had gone through in the last two days."

POISONING BY CYANIDE.—A sad accident occurred at Wadbridge last week, when a little boy, two years of age, son of Mr. C. Lobb, photographer, got into the dark room while his father was engaged talking to some customers, and drank from a bottle of cyanide that had just been in use. Death occurred in about ten minutes. The coroner's jury on the evidence laid before them returned a verdict of "Accidental Death."

REMARKABLE MIRAGE AT DOVER.—A mirage was strikingly conspicuous on Sunday afternoon and evening at Dover. The dome of the Cathedral and Napoleon's Pillar at Boulogne were to be seen from the Crescent Walk by the naked eye, but with a telescope of ordinary power, the entrance of the port, its lighthouse, its shipping, and the surrounding houses, the valley of the hillside of Capécure, and the little fishing village of Portel, were distinctly visible; whilst on the eastern side the principal features of the country—the lighthouse of Cape Grincez, the adjacent windmill, numerous farms and villages, with their windows illuminated by the setting sun—stood out with extraordinary clearness. Whilst these were under observation, a locomotive was seen to leave Boulogne and travel some miles in the Calais direction by its puffs and wreaths of white steam. Shortly after sunset the mirage subsided.—*Dover Chronicle*.

UNEVEN DRYING OF SENSITIZED PAPER.—To prevent the silver solution from collecting in drops on the albumen paper, buff the surface with a tuft of cotton before sensitizing.—*D. G. Munger, in Philadelphia Photographer*.

STRENGTHENING NEGATIVES BY HEAT.—A correspondent of the *Philadelphia Photographer* says:—"As the tendency of all intensifiers is to flatten and destroy the beauty of the photograph, it is desirable to omit them as much as possible. I often avoid their use by the following 'dodge.' If, after the negative is developed, fixed, and washed, it needs a little reinforcing, I dry it rapidly by the stove or otherwise, which usually brings it right for printing. Any one who will try the experiment will be surprised at the difference between a negative thus dried and one that is allowed to dry spontaneously. Negatives, after washing, should be flowed while wet with a solution of gum-arabic in water. This prevents the hard varnish from changing them."

USING IMPERFECTLY CLEANED GLASSES.—The Hon. Nassau Jocelyn writes: "I recently heard of a very good plan for using dirty glasses—not that any careful workman would do so willingly, but sometimes it is pleasant to be independent of a glass cleaner. Take of ether and alcohol 100 and 10 parts re-

spectively, and add to them 1 part of ordinary uniodized collodion, and 1-5th part of tincture of iodine. Spread this very thin film on the glass, and, when it has set, collodionize and sensitize as usual; this forming a perfectly chemically clean surface, it is natural that any dirt or stains which may lie beneath will not appear in the upper film. This proceeding is useful under certain circumstances, when the conditions of the atmosphere do not favour an easy cleaning of plates by the ordinary method.

To Correspondents.

J. STOTHARD.—To have made an acetate toning bath properly, the gold salt should have had the acid driven off by evaporation at the outset; but by careful management of the solution you have, in the manner we indicated, you will get, as you have doubtless found, very good warm black tones, especially with vigorous prints. The object of the various additions to the chloride of gold solution is to induce a tendency to decomposition, liberating the chlorine, and precipitating the gold in a metallic form. The colour of gold precipitated in this way is modified by the size of the particles, and the size of the particles is modified by the substances used to effect the decomposition. If the decomposition be rapid, as when carbonate of soda is used, and the prints be immersed at once whilst there is nascent chlorine in the solution, the prints are attacked and become mealy and grey. If from imperfect evaporation of the acids in making the gold salt, as in your case, hydrochloric acid, or chlorine, is present in the solution, a similar result ensues. 2. For a strong developer for short exposures, avoid gelatine. Use a strong iron solution with a small portion of acetic acid. Try 40 grains of protosulphate of iron and 20 minims of acetic acid. Gelatine promotes vigour and cleanness, and, in short exposures, often tend to hardness. Thanks for your reminder as to the method of copying. We shall describe, shortly, your application of it.

DUFFER.—It is legal to copy a picture in which there is no copyright. The registration at Stationers' Hall does not confer copyright, it is only a necessary record of the existence of copyright. If you possess the copyright of a picture it is necessary to register it at Stationers' Hall, but such registration would not give you a copyright in something belonging to another. If your object be to ascertain whether by registering your copy of a non-copyright picture you acquire a copyright, the answer is, that you acquire a copyright in your copy, but that would not deprive anyone else, who had opportunity, of the right to copy the original picture. 2. If you send a description of the photograph in the form we have often described, together with fifteen stamps, to our Publisher, he will duly register it for you and pay the fee. 3. The printing bath turning white and turbid indicates that it is getting weak, and is dissolving the albumen and chloride from the paper floated thereon. 4. Excess of salt will redissolve a portion of the chloride of silver in the washing water, instead of precipitating it; but no proportion of salt can be given, because the proportion of silver present is unknown. Take care to add a little at a time for safety; or, better still, use hydrochloric acid to precipitate the chloride, in which case there is no danger of adding excess.

AN AMATEUR.—It is very probable that the cause you suggest may have operated in your case, and that the use of excess of silver in your collodio-bromide may have been the cause of practical insensitiveness. We scarcely agree with you that a process which is rendered worthless by want of precision in carrying it out is not worth pursuing. Precision is one of the first requisites in successful photography. However, there is large choice of excellent dry processes open, and the gum process we know to be excellent. Thanks for your experience confirming the value of permanganate solution for rectifying the bath.

SILEX.—The occasional uneven tinging of collodio-chloride prints is due to the use of a repellent horny collodion, which prevents ready and even permeation of aqueous solutions. The white opaque effect in the shadows is also due to unsuitable collodion. The plain collodion used should dry quite clear and transparent when tried on a glass plate; some samples dry dull, opaque, or opalescent, and such will give dull, grey, opaque shadows when employed for collodio-chloride. We explained the reason why your questions frequently do not reach us. We never neglect to answer questions which do not seem important, because we know that the most trivial difficulty is important to one suffering under it.

X. Y.—Spirits of wine 56 over-proof is not sufficiently highly rectified for making collodion; it should not be less than 60 over-proof at weakest; it is usually used stronger than that. Spirit of 56 over-proof is about 837 sp. gr.; spirit of 60 over-proof is about 830 sp. gr.; and spirit of 63 over-proof is about 823 sp. gr.

W. F. MORGAN.—You are right in your statement of Mr. England's practice; but as very little more silver solution need be used than is necessary to cover the plate, and as the solution poured off may be added to the residues, there need be little waste. The results are, as you observe, exceedingly perfect.

W. H. PAYNE sends us a good 10 by 8 architectural photograph, to show how perfect a result may be obtained with a Jamini quarter-plate lens. He does not state the focus of the lens; but the result is certainly good.

II. W.—Mr. England generally uses distilled water for the first and final washes, using common water for the copious washing. In his last Continental trip he wet with good rain water, which answered every purpose. 2. In mixing iodides or bromides with plain collodion, the quality of the latter determines the mode of proceeding. If it be too thick for use, then the salts must be dissolved in a proper quantity of alcohol, and added; but if a collodion of considerable body be required, and the plain collodion be of the desired thickness, the salts must be added direct, and dissolved by frequent agitation. For such a purpose, the most soluble salts, such as those of cadmium, should be chosen.

S.—The formation of oxide of silver by the addition of lime water to nitrate of silver solution might be useful to the photographer; but, on the whole, we prefer the method we usually recommend; namely, the addition of a little caustic potash to a solution of nitrate of silver. Thanks.

II. S.—The residue you describe as obtained after boiling your bath to dryness and fusing, which you sent a week or two ago, we find to consist for the most part of reduced metallic silver, the appearance of which was, however, much altered by the presence of sulphate of silver, together with some crystallized nitrate. Upon applying heat, we found no difficulty in dissolving the precipitate in nitric acid.

W. J. A. G.—As a rule, the use of strong hyposulphite solution and short immersion is safer and better than the use of weak solution and long immersion. In some cases, especially in prints from weak negatives or with highly salted paper, the prints are somewhat reduced and weakened by using very strong hypo; but we never like to use less than a quarter of a pound to a pint of water. The use of a warm hypo bath, except in extremely cold weather, is not desirable, as it will impoverish the prints and reduce the tone more, and heat facilitates decomposition in the hypo bath. 2. In the studio you describe you will find the use of a black or dark blue blind over half the top very desirable for securing shadow. See our recent notice of the studio of Mr. Williams. Much depends on the size of the room as to the best mode of sliding. If the room be small, let it slide from side to side; if large, and two or three blinds will be necessary to cover the skylight, let them slide from eaves to ridge, using one or more down at a time as necessity may require. 3. Mr. England's Rhine views were produced from dry plates. You can obtain them of Marion, Solio Square.

P. S.—The heat of a common fire, unless kept up very high with bellows, is not sufficient for reducing residues. The best plan will be to break up the slag, add more flux, and apply the heat of a proper furnace. 2. The term "Ivorytype" has been given to several forms of photograph which have been made transparent; but generally with colour. Several such processes have been patented, but we believe that none of the patents are maintained. We have published several such processes in the News at different times; but we cannot, without more definite information as to which process you want, give details here. If you can let us know more precisely, we can probably refer you to the information you require.

R. GILLO and KENT.—Received. Thanks. In our next.

Several Correspondents in our next.

Photographs Registered.

MR. H. SWINSON, Gloster,
Photograph of an Engraving of a Triumphant Arch at Gloster 1771.

MR. GIBSON, Hexham,
Photograph of Miss Burnett.

MESSRS. CALVE and OSGUTHORPE, Sheffield,
Photograph Group of Founders of Odd Fellows.

MR. H. WATSON, West Bromwich,
Photograph of Rev. H. Farrow.

MR. T. ANNAN, Glasgow,
Photograph of Lord Bilhaven.

MR. THOS. FORREST, Pont-y-pridd.
Photograph of the late John Hewitt.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Mr. McLachlan's Discovery.....	253
The Retouching of M. Adam-Salomon's Pictures.....	254
Mr. McLachlan's Nitrate of Silver. By John Spiller, F.C.S. ...	254
Pictorial Effect in Photography. By H. P. Robinson.....	255
Gradated Backgrounds for Heads, etc. By R. Gillo.....	256
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey.....	256
Collodion-Cuir and the Carbon Process. By M. Despaquis.....	257

	PAGE
On the Preservation of Collodionized Plates in a Moist Condition. By General Mongin.....	258
Remarks upon the Wet Collodion Process. By Mr. McLachlan	259
Proceedings of Societies—Liverpool Amateur Photographic Association.....	261
Correspondence—Sel Clement—Injury to Negatives by Vanishing.....	262
Talk in the Studio.....	262
To Correspondents.....	264

MR. McLACHLAN'S DISCOVERY.

WE shall now endeavour briefly to state what appears to us to be the suggestions to be derived from Mr. McLachlan's experiments. The chief feature of his operations appears to consist in his care to produce a neutral bath. In stating this, it is only fair to say, however, that he himself very emphatically denies that the issue of his treatment of the nitrate of silver solution simply results in the production of a neutral bath. He insists that some unknown, unrecognized change is effected by the action of light on the neutral silver solution, by which it acquires new properties quite distinct from those of any bath, either acid, alkaline, or neutral, hitherto known. We must decline, however, to refer to occult causes results which can be assigned to known agencies; and pending the further test of experiment, which it is always fair to Mr. McLachlan to hold in reserve, we may without impropriety consider how far the good results he has described may be consistent with much that is already known, but the importance of which is possibly not sufficiently recognized.

Mr. Spiller's experiments lead him to believe that the results described by Mr. McLachlan are due to the presence of a trace of chloride of silver present as an impurity in the nitrate used, and this view is strengthened by an examination of the sample of Mr. McLachlan's favourite nitrate, details of which will be found on another page. Whether this be the explanation or not, Mr. Spiller's experiments have shown that a 20-ounce bath to which 1 grain of chloride of sodium had been added, after sunning for some weeks, and treating with caustic potash, as directed by Mr. McLachlan, gave, with a collodion rendered colourless and neutral by treatment with a potash solution, perfectly brilliant and clean pictures, without any trace of fog, as an example now before us proves. Thirty drops of a solution containing half a grain of caustic potash in an ounce of water were added to the pint of nitrate solution, which was, according to Mr. Spiller, rendered quite neutral, and according to Mr. McLachlan decidedly alkaline. We may here, by the way, remind Mr. McLachlan of a fact which seems to have escaped his attention, and may have misled him in some of his conclusions. He assumes that the bath is necessarily in an alkaline condition, because it slowly restores the blue colour to reddened litmus paper. He should remember that a solution of perfectly pure nitrate of silver will restore the blue tint of reddened litmus paper.

We return, however, to the fact that a bath so free from any trace of free acid as to slowly restore reddened paper, and a collodion rendered colourless by caustic potash, did give clean brilliant negatives. This is, of course, not absolutely novel, but it is certainly rare. The tendency of working in late years has been to a decided increase in the use of nitric acid in the negative bath. The neutral bath and freshly

mixed simply iodized collodion in a colourless neutral state, which many years ago were regarded as securing the perfection of conditions, are now almost unknown. When simply iodized collodions were employed, the least trace of nitric acid in the bath was fatal to sensitiveness, and it was never employed; but, since the use of bromo-iodized collodion for negatives has become universal, nitric acid—which, when bromides are present, interferes little with sensitiveness—has been largely used as a means of preventing fog in a bath which would otherwise give dirty negatives. The free use of nitric acid has, in fact, often permitted the use of a bath containing considerable impurity.

Now, we are by no means sure that the use of nitric acid in tolerably large proportion is an evil. We have used it freely for many years without suffering any serious inconvenience which we can trace to its use. But there are certain evils which may result from its use which are worth considering. In the first place, if a collodion containing a very small proportion of bromide be employed, nitric acid will impair sensitiveness. In the next place, under many circumstances it tends to the formation of a thin grey metallic-looking image, instead of the dense brown image desirable in a negative. In the next place, its presence in the nitrate solution will tend to oxidize the alcoholic bodies accumulating in the bath, and to cause the formation of aldehyde, and so gradually induce the fog it was added to prevent. And finally, the presence of nitric acid increases the tendency of the bath to dissolve iodide of silver, which will, therefore, more rapidly increase in the bath the greater the proportion of nitric acid present, and so promote the accumulation of one source of pinholes.

Having regard to these considerations it may be well worth while to consider whether the system, the practicability of which Mr. McLachlan's experiments suggest, of working with a perfectly neutral bath, and a collodion without any trace of free iodine, by which nitric acid would be liberated in the bath, may not possibly tend to diminish or eliminate many of the evils which are occasionally troublesome in the ordinary mode of working. Confirmatory experience is not found wanting. Many photographers have stated that a nitrate bath neutralized and sunned often works admirably without any addition of acid. Mr. Blanchard has more than once stated this fact in our pages. Mr. England, who works with a nearly neutral silver bath, also works with a perfectly colourless collodion; and the practice of some other authorities tend in the same direction.

The fact that the iron developer yields cleaner and brighter results when it contains a trace of a persalt is not new, but has long been held by the majority of the practical photographers. Mr. McLachlan's somewhat roundabout mode of securing the oxidation of the iron salt does not, so far as we can at present see, possess any advantage over the simpler known methods.

To his condemnation of the use of bromides in collodion we cannot attach any weight, inasmuch as it is not sustained either by any statement of reasons or of experience. On the contrary, we find that he prefers, and in his own practice employs, a commercial sample of collodion well known to contain a bromide.

That some uncertainty in working should occasionally arise in the practice of the ablest and most experienced men is, as before pointed out, inevitable from the inherent nature of the wet collodion process; but we believe by far the most fertile cause of troubles is one which was suggested in the course of the discussion at the Photographic Society by more than one speaker: we mean the over-working of baths. In many cases one or two baths of not much larger capacity than is required for sensitizing the size of plates employed will be worked incessantly without replenishment and without rest, day after day in constant practice. Sometimes collodions of different constitutions are excited in such baths. Ether, alcohol, iodide of silver, the bases of different iodides and bromides, and occasionally the traces of plate-cleaning mixtures on the edges of the glass, are accumulating in the bath, whilst every plate abstracts silver, which is the one essential element the bath requires. It is not surprising that working conditions should often be impaired, and sometimes entirely break down.

We will conclude by describing the practice recently detailed to us by one of our ablest and most experienced professional portraitists, a practice in the course of which troubles with the nitrate bath are almost unknown. Six 40-ounce baths are continually kept in use, one for each day in the week. The quantity remaining of each bath is, at the close of each day, emptied into a wide-mouthed bottle, and set aside, loosely covered with a piece of paper to preserve it from dust, but not stoppered to prevent the escape of ether and alcohol. After five days' rest, it is filled up to its full quantity with a fresh 50-grain solution without any iodide of silver, filtered, and again brought into use; when, as might be expected, it is found to work in all respects satisfactorily. The plan of filling up with fresh plain solution, it will be seen, prevents the rapid accumulation of iodide of silver, whilst it prevents the weakening of the bath. The accumulation of ether and alcohol is checked by the facility for evaporation, and the well-known advantages of rest are secured to every bath. Under such a system the photographer is never placed *hors de combat* by the sudden (and as some fancy) inexplicable, although really very natural, complete break down of perhaps the only nitrate bath he has to rely upon for his daily practice.

THE RETOUCHING OF M. ADAM-SALOMON'S PICTURES.

It is somewhat late to revive the question of the retouching of the marvellous portraits produced by M. Adam-Salomon, inasmuch as the majority of photographers taking interest in the matter have had opportunity in one way or other of personally examining some of the prints, and confirming our repeated statement of the case, to the effect that whilst some of the prints are more or less retouched, a large number, and these the finest, are quite untouched. As we have some confirmatory evidence to add on the subject, it may be worth while once more briefly to refer to the question. M. Salomon has recently favored us with a number of unmounted prints rough from the washing trough, chiefly duplicates of those we exhibited some months ago in Conduit Street, and permitting, therefore, of the most minute comparison between the finished print and the rough unmounted. The test is a most satisfactory one, and proves that those prints in which a little touching is manifest owe very much less to the pencil than even the most careful observers would imagine, being for the most part perfect in detail, in modelling, and a brilliancy without any touch whatever, and every one distinguished by that exquisite ren-

dering of texture and colour in which a perfect distinction is maintained between the tint of flesh and of white linen, a distinction which so many photographers, in their aim to secure factitious brilliancy, contrive so often to destroy.

One especial fact is worth noting. A correspondent of one of the journals affected some time ago to describe an analysis or examination of one of the prints described as "The Lady with the Riding-whip," and stated that after removing the encaustic and sponging the print, all the retouching being removed, a hard black-and-white picture, destitute alike of detail and modelling, remained, proving M. Salomon, although a good artist, a bad photographer. Now we have both the finished and the unmounted print of this negative before us, and we find in the latter as well as the former an exceedingly fine photograph, possessing much very perfect and delicate half-tone, as well as the greatest richness and brilliancy. We can only come to one of two conclusions, therefore: either that the writer in question stated what was not true, or that he had performed a work like that of some unskilled cleaners of oil paintings, who contrive to remove not only dirt and dirty varnish, but also half the work of the painter, and, having done so, descant on the want of skill in the artist. It is possible, of course, by dint of resolute friction, to scrub away parts of the surface of an albuminized print, and so destroy part of the picture.

We shall have pleasure in showing these unmounted prints to any of our readers who may desire to see them, and who have opportunity to call at our residence for the purpose.

MR. McLACHLAN'S NITRATE OF SILVER.

BY JOHN SPILLER, F.C.S.

On the 12th instant, Mr. McLachlan was kind enough to give me a sample of the nitrate of silver which he found to be peculiarly well fitted for the preparation of the bath according to his recent instructions. The crystals have a distinct violet tinge (or "dirty bluish-looking appearance," according to the published description), which is, however, confined to the surface, for if they be momentarily washed with water all the colour is at once removed, and the pure white (or colourless) nitrate underneath, if then taken out, dried, and sunned, does not appear to be in any way affected. The aqueous solution obtained by washing the crystals was discoloured as though by the presence of blackened chloride, sulphide of silver, or other dark matter in suspension, and on filtering the solution it came through bright and clear. The insoluble portion left on the filter was, however, exceedingly small, and I am only able to say of it that its bulk was diminished by treatment with ammonia as though by partial solution. I found, also, that the discoloured crystals gave a clearer liquid when dissolved in dilute ammonia than when pure water was employed as a solvent. Nitric acid added to either of these ammoniacal solutions produced a faint turbidity, as though chloride of silver in small quantity was precipitated. I tested the clear aqueous solution of the crystals, for metallic and other impurities, by adding hydrochloric acid in slight excess to throw down the silver, separating this by means of a filter of Swedish paper, and evaporating the clear filtrate to dryness in a small porcelain capsule mounted on a water bath. There was practically no residuum, and not even a trace of lead was indicated by iodide of potassium; so that I may fairly assume that the fine silver from which these crystals were prepared was perfectly pure.

By way of accounting for the peculiar discoloured appearance of the crystals, which I have shown with some degree of probability to be due to a very superficial incrustation of blackened chloride, it has just now occurred to me that this sample of nitrate of silver may have been spread out to drain and dry in a slightly chlorinated atmosphere, such as would result from the simultaneous preparation of chloride of gold,

or the working of platinum—operations in which *aqua regia* is employed—in the same laboratory; and although such a film of chloride, at first white, might not be noticed in the ordinary course of manufacture, it would undoubtedly render the crystals liable to alteration by light.

I have only to add, that the sample given me by Mr. McLachlan was apparently neutral to litmus paper; but this mode of testing for free acid in silver-salts is not nearly so delicate as is commonly supposed.

Woolwich, May 25th, 1868.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XVIII.

"In such cases there will be found a better likeness, and a worse; and the latter is constantly to be chosen."—*Dryden*.

"The body of beauty is as essential as the soul of truth—truth without beauty cannot make art. * * * Without beauty there is no art. Over both the choice of subjects and their execution, this canon is inflexible. No other consideration in the choice of a subject, and no other merit in its execution, can atone for the neglect of beauty. Mere accuracy of portraiture is draughtsmanship, not art. The artist is he who above all men has an eye for the beautiful, and can embody the beautiful in some art form."—*Tainsh*.

PORTRAITURE—continued.

As I am dealing with principles, I shall not, in these chapters on portraiture, give any illustrations of poses, which could be of very limited application, and would only induce in the student a habit of servile imitation, very detrimental to originality, and unworthy of him who would call himself an artist. An inferior photographer may find a few illustrations of different poses of some use to him, inasmuch as they may assist him in varying his *one* pose; instead of the one pose beyond which his feeble imagination will not allow him to venture, they may give him the use of three or four; but if he will take the trouble, or has sufficient ability, to master principles, he will find himself possessed of a continual fund of ideas ready for use, as is necessary in successful portraiture, at a moment's notice; if he have not the ability and patience to master the few principles on which his art is based, I hope he will excuse me if I hint that he had better try some other means of being of use to his fellow-creatures, for he would be only doing mischief to photography by continuing in the profession.

Besides being of very little use, there is also actual harm in a "set" of poses, the structure of which is not understood, as will be seen if a sitter is allowed to select the position in which he will be taken, and which has perhaps exactly suited some other person.

Sitters often want to be made to look like other people; or, rather, they think that if they sit in the same position and attempt the same expression, however unsuitable, they will look as well as some example they have seen. It constantly occurs that persons will come into the reception-room, and, selecting a portrait of another totally unlike in age, style, and appearance, will say: "There, take me like that." Peter Cunningham gives an anecdote that, possibly, may be out of place here, but is too good to omit. "When Bernard Lens was drawing a lady's picture in the dress of Mary Queen of Scots, the fastidious sitter observed: 'But, Mr. Lens, you have not made me like Mary Queen of Scots!' 'No, madam,' was the reply; 'if God Almighty had made your ladyship like her—I would.'" The same may be said of the *lenses* of the present day!

Other sitters endeavour to improve their faces by all manner of contortions: stare with their eyes to make them larger, and screw up their mouths to make them smaller. Opie was once troubled with such a sitter, and he quickly said to him (so Haydon tells us): "Sir, if you want your mouth left out, I will do it with pleasure." Instead of blunt wit of this kind, the photographer will find it answer better, and will involve less trouble, to make the sitter forget his mouth

altogether. This cannot be done if the sitter is constantly reminded of particular features. Many photographers keep a cheval glass in their studios to enable their sitters to look at themselves while the exposure is proceeding. There are rare cases where the practice may be beneficial, but on the majority it has a very bad effect. I have tried it in my own practice, and found it was a great temptation to the sitter to make the most ridiculous contortions of the face, in the hope of calling up a satisfactory expression. King Lear's wise fool was, perhaps, not far wrong when he said "there was never yet fair woman but she made mouths in a glass."

A good deal depends on the temper of the sitter at the time of sitting. If he come in a great hurry, and feel bored by the operation, good results cannot be expected. Engagements should be made that sitters should not be kept waiting. This is not so difficult to manage as may appear. Be punctual, and exact punctuality. Do not accept pictures to do in half an hour that should have more than double that time allotted to them. It is impossible to make a hungry man look happy. It may be said of a man whom the photographer has kept away from his dinner, as Menenius Agrippa said of Coriolanus:—

"He was not taken well: he had not dined;
The veins unfilled, our blood is cold, and then
We pout upon the morning, are unapt."

It almost constantly happens that the photographer sees his sitter for the first time as he enters the studio. Thus he has no opportunity of studying the characteristic attitudes or expression, or the best general arrangement or effect. This difficulty is almost insurmountable, but can be most nearly overcome by an intimate acquaintance with the rules of art, which will enable the artist to think quickly and make all his arrangements without hesitation, thus allowing him more time to study character. The figure should not be posed until everything is ready, and then the final arrangements should not take a minute. This can only be done when the operator quite knows his business, and has thoroughly made up his mind what he is going to do. He should be able to see the finished result in his mind's eye from the beginning. There is nothing so irritating to a sitter as being kept waiting after being posed; he begins to feel he is in a ridiculous position, when it should be the object of the photographer to prevent him thinking that he is in a position at all. A well-posed figure may be easily upset by a bungling use of the head-rest. (Let us lay it down as an axiom that this instrument is indispensable, even for short exposures, say of five or six seconds.) The rest should be understood, in ordinary cases, to be a delicate support, not a rigid fixture against which the figure is to lean. There is another rule that photographers should regard as axiomatic: *the rest should be moved to the head, not the head to the rest*: first the pose, then the rest; not first the rest, and then the pose. In my own practice, I prefer a very light, simple rest, of the old American pattern, without any complications; one so light that I can carry it about after the sitter without trouble.

It must be borne in mind that, in a good photographic portrait, as in a painted one, it is expected will be produced—

"Not the form alone
And semblance, but, however faintly shown,
The mind's impression, too, on every face."

Here the educated photographer has a great advantage over those who are less fortunate. He will endeavour to so entertain his sitter that he will feel more at ease than if he were taken into a strange room, fixed inconspicuously in a chair, and photographed. It will be found that not only the expression will be improved, but that pictorial effect, as regards arrangement of lines, will also be much improved by the increased ease the sitter feels as he becomes more familiar with the studio and the student. I have known many persons who, after months of persuasion, have consented to have their portraits taken, and who come in fear and trembling, but who, by judicious treatment, have eventually so posi-

tively enjoyed the operation, that it has become almost a passion.

It is more than probable that this objection to "sit" has been engendered by the brusque manners and rough, uncourteous, and concealed behaviour of photographers themselves. A certain amount of self-confidence, if there is any basis for it, reacts favourably on the sitter, but it should not be carried too far, or some sensitive people may consider it amounted to rudeness.

A good deal depends on such an apparent trifle as the manner of taking off the cap of the lens and exposing the plate; and there is as much difference in the method of performing this simple operation as there is difference of opinion amongst photographers on any other circumstance connected with their art. One will shout: "The exposure's agoing to begin!" in such an angry and threatening tone that you feel inclined to call the police; while another will so smother you with the suavity of his manner that you feel ashamed of troubling him. The first rarely succeeds in anything but disgusting his customers; the other oppresses them by over-politeness. It is evident that some course between these two is the correct one. The photographer must have a strong will to enable him to carry out his idea as to arrangement, and sufficient subtlety to do so, and, at the same time, please his subject. His motto must be, *suaviter in modo, fortiter in re.*"

It may be asked: What has all this to do with "Pictorial Effect in Photography"? Simply this: It is the province of the artist to secure the most characteristic, the most truthful, and the most pleasing aspect of every subject; and that, without regard to the matters to which I have been directing attention, character, truth, and beauty will alike be wanting in photographic portraits, whether the originals be common-place or distinguished.

GRADATED BACKGROUNDS FOR HEADS, ETC.

BY R. GILLO.

THE effect of gradation on a background in producing relief in a portrait often seems to be overlooked by photographers. Ruskin says: "No colour exists in nature, under ordinary circumstances, without gradation," and enforces again and again that an ungradated touch is bad at any time. Any one, on looking over a collection of photographs, vignette heads, medallions, &c., cannot fail to notice the even and unbroken tint of the backgrounds generally. Look at a portrait by a first-rate artist, a miniature, or any finished work of art, and you will find the background a study of itself, and that on account of the gradation it contains.

The following plan will, in great measure, supply what is wanted, without extra time or trouble:—A square background (about four feet is a convenient size), on a frame with a cross-piece at the back, in the centre of which is a hole to allow the horizontal rod of rest to pass. It will be seen that when the rest is placed against the head of the sitter the face appears in the centre of the square. There will be found no difficulty in painting this small background with a gradation from dark on one edge to light at the other. Lampblack and whitening, with a little size, answers capitally.

When you have arranged the sitter, you can turn this round any way you please: light at the top, shading into dark below, or *vice versa*, or a diagonal gradation to suit circumstances and your own feeling. It is astonishing the different effects produced by turning this background round. Sometimes the effect may be improved by shielding part of the light from the background with a blind or curtain. From the fact of this background being so close to the head of the sitter, you often get a boldly cast shadow from the head or shoulders, which is very effective.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

HANDLING SENSITIVE PAPER—FILLING FRAMES, ETC.

THE chemical influences which work out a photographic facsimile of objects are so delicately arranged, so exquisitely sensitive to disturbing agencies, and the turning points that create an issue of weal or woe are so tenderly balanced, that a philosophic regard for minor details becomes an imperative necessity if the operator would steer clear of the difficulties that so frequently make shipwreck of his hopes and productions. Doubtless many of my readers who have hitherto failed to recognize the importance of minor considerations will feel inclined to scoff at the idea of any value being attached to so insignificant an operation as handling paper and "filling in frames." Whether inclined to scoffing or scepticism, believe me, dear reader, when I say that I would prefer entrusting the work of printing to inexperienced hands than allow the paper to be creased, thumb-marked, and stained by the careless fingers of an ignorant assistant, whose sins of commission and omission are too frequently visited on the devoted head of the paper-albuminizer or dealer, whose daily routine is made a worry and bore by the complainings of thoughtlessness and the denunciations that proceed from ignorance.

And here let me observe, I have not the slightest ambition to become a sensational agent, nor do I wish to wound the self-esteem of photographers; but I am backed so strongly by evidence indisputable I hold in my possession that I have no hesitation in asking every photographer to pay heed to the instructions I from this point proceed to give, for they need it sadly. And I beg every reader to throw his prejudices in favour of this or that method overboard if the results such methods yield are wedded to uncertainty. I fully purpose placing in the hands of my readers a sure and certain remedy for all toning difficulties, a remedy based on strictly scientific grounds. And I must here apologize for the liberties I feel bound to take in showing that, however strong the remarks and ridicule levied on the self-devoted, and, I believe, entirely disinterested Mr. McLachlan, on account of the round-about path he takes to obtain certain results, precisely the same adverse arguments apply to all the fashionable toning methods, where the fanciful bases either perform their work tardily, or bother the action of the gold in such a way that it takes a fit of sulks, and won't tone at all.

When sketching out the design of the present series of papers on printing matters, I purposed taking each operation in regular course, and to deal with all matters pertaining to silver printing exhaustively; but I am tempted to deviate from my original plan by the numberless applications I am receiving from all parts for aid in ridding the applicants of their toning difficulties; and as the season is advancing I am desirous of assisting my readers in the most effective manner; consequently I shall run through the preliminary instructions as briefly as possible, and at as early a date as circumstances will admit.

I shall first deal fully with the toning bath, and afterwards retrace my steps to describe the various dodges connected with the printing which are resorted to by printers who are desirous of getting something more than the negative alone is capable of yielding.

I now return to the high road, and proceed to deal with the handling of photographic paper. Summarizing the remarks I have to offer, and, for simplicity sake, dividing them into three parts, my first is a caution.

1st. Never bring two albuminized surfaces into immediate contact, either previous to, or subsequent to, sensitizing. Neglect of this rule occasions abrasions, streaks, subdued lustre, and divers other imperfections, which the injured prints alone are capable of rendering intelligible.

2nd. Avoid any contact of fingers with the surface of the sensitive paper. However clean the fingers may have

been made with soap and water, there is always a saline dampness exuding from the skin which will produce markings on the paper that by no means improves the beauty of the picture aimed after.

3rd. By every precautionary mean take heed that the paper at its back be not defiled. Nothing so forcibly shows up a slovenly workman as display of hideous, yellowish, greenish and mud-coloured stains on the backs of the prints he produces. I would as readily condemn a print stained at its back as one spoiled on account of any unconcealable defect.

When cutting up paper I prefer using scissors, placing the paper before me, sensitive surface upwards. If carte size pieces are needed I cut the paper into two halves, again divide into quarter sheets, and once more subdivide into quarter-size pieces. A sheet of paper thus treated should yield thirty-two carte prints. For pictures of larger dimensions the requisite mode of procedure will be readily suggested to those who make up their minds to go in for perfection. It will be observed that I do not fold the paper at all, and it is surprising how accurate the eye becomes after a brief allowance of practice.

Moving on another stage, I ask care and attention in the "filling in of frames." Don't be over "cheese-paring;" cut the paper large enough, for it is wise at all times to allow a margin beyond the extremities of the negative for handling purposes. When fingering the paper the fingers should, as much as possible, be applied to its edges; never must they be permitted to touch the surface on which any portion of the picture is to appear.

The remarks contained in the above threefold division deserve the careful attention of those who are desirous of obtaining clear and delicate prints. The reward I offer to all who will digest and practise the hints embodied in those paragraphs are unsullied prints, on surfaces as brilliant as the albumen surfaces they received from their photographic paper dealers.

The subject of printing now demands attention, and I ask my reader to recall to memory the sun *versus* shade printing controversy which, a few months since, engaged the pens of Mr. Cherrill and myself. Since that time I have paid special attention to the subject, and the results of my numberless experiments have more than ever convinced me that sun printing (save under rare exceptions) is altogether a mistake, oft-times the unsuspected cause of failures and unsatisfactory results. If the several gradations of a negative that range, without perceptible divisions, from opacity to transparency, maintained a proportional power to resist light under all circumstances, sun printing would, under such conditions, be perfectly admissible; but on reflection it must be admitted that such is not the case. Direct sunlight finds ready entrance where diffused light would be for a longer time excluded; hence it follows the weaker light effects a considerable reduction in the deeper shadows ere the higher lights become at all changed. A second and no less forcible protest against sun printing presents itself. When an excited albumen surface is exposed to diffused light, the most sensitive salt first succeeding that salt being the chloride of silver, the print for a considerable time is seen to assume a violet hue. If the light is very weak the picture finishes up without reduction, to any extent, of the organic salt; but in ordinary diffused light, with the now usually weak salted paper, the albuminate of silver goes to make up to a considerable extent the last printed half of the picture. Thus we have the softness of the chloride picture with the vigour and persistency which the albuminate of silver imparts, and together, perfection is to a considerable extent worked out. But alter the conditions; instead of printing in diffused light do so in the direct solar rays: what is the result? The albuminate of silver is reduced at once; a superficial film of the reduced organic salt is made to form the picture; the dense portions of the negative are penetrated long before the shadows have attained the requisite depth, and you have a poor, flat print, which, in some instances, appears as mealy before toning as one that had been

exposed to the most virulent attack of chlorine. Reason why: If the surface of a negative is closely examined, it will in most instances be perceived that the deposit by re-development is not perfectly even, that some portions are more transparent than others; the defect described is not seen when the print is executed in diffused light, but sunlight penetrates direct, everywhere, and registers everything. My advice, therefore, must be, print in diffused light, except you have a specimen of the ancient "soot-and-whitewash negative to deal with; then by all means print by the direct solar rays. The quicker the printing qualities of a negative, the deeper the gloom in which the printing should be conducted. I frequently allow a whole day for printing a copy from a negative which, in sunlight, would yield hundreds of copies in the same time. But quality makes ample amends for loss of quantity. As I am soon to enter on toning matters, if you make up your minds to try my new-fashioned method, do not print much deeper than needed in the finished picture, and place it in your portfolio, where it must remain until my next, which, on account of the many demands I have received, will soon put in an appearance. And until details are given, pray accuse me not of egotism.

COLLODION-CUIR AND THE CARBON PROCESS.

BY M. DESPAQUIS.

At the April meeting of the French Photographic Society, the author demonstrated the practical working of the process he employs to obtain photographs in pigments by means of collodion mixed with castor oil, a compound denominated *collodion-cuir*. The film of collodion on which the pictures are produced may either be rendered dull and semi-opaque, like ground glass, or may be left in its original transparent condition, the prints in the latter case having the appearance of glass photographs. Throughout the process ordinary spring water may be used, and the gelatine employed, so long as it is soluble, need not be of the finest quality; it is as well sometimes to add a few drops of ammonia to the gelatine solution, to prevent the formation of air-bubbles when the material is being poured upon the glass or paper surface. The best colouring matter that can be used in the process is indian ink of the finest quality which has been carefully filtered; for portraiture no other pigment is admissible. Lamp-black and other similar materials, although very finely ground, always produce a disagreeable effect in the delicate half-tones of a portrait, where the minute grains or particles of the pigment are visible. For landscape photography, however, lamp-black may be used with advantage; it is more intense in colour, and likewise more moderate in cost, for while 100 grammes of it may be obtained for half-a-crown, the same amount of colouring would scarcely be produced by a litre of indian ink, costing from twelve to sixteen shillings. To improve the tone of the prints, various colours may be added to the blacks employed, such as archil red, Prussian blue, purple, &c.; indigo is also one of the finest colours that may be used, as it is soluble, and produces no grain. Unfortunately, mixtures containing indigo preserve their sensitiveness for a very short time only, and it is necessary, therefore, to employ the same within twenty-four hours of its preparation. In fact, whenever any other pigments but indian ink, or a carbon black of some kind, are employed, the sensitive mixture does not retain its qualities unimpaired for more than a week, fortnight, or at most a month; whereas compounds made up with indian ink and bichromate of ammonia preserve their sensitiveness for twelve months or more. If bichromate of potash is added, the mixture soon loses its sensitiveness, and becomes useless after a period of two days.

The formulæ used are as follows:—

Gelatine ...	...	10 to 12 grammes
Indian ink ...	...	20 "
(Or of lamp-black a sufficient quantity.)		
Water ...	...	80 "
Colours according to circumstances.		

This mixture is dissolved in a porcelain dish on a hot-water bath, and then is added:—

Bichromate of ammonia... 1½ grammes

The whole is agitated for several minutes, in order to bring about perfect dissolution and mixture of the bichromate.

A glass plate, such as is used for obtaining gelatine moulds, is rubbed over lightly with a little ox-gall: it is then coated with the sensitive mixture by passing it over a very fine wire sieve covered with a piece of fine cambric, the superfluous material being poured off and the plate allowed to dry horizontally. Five or six hours are required to dry the film when placed in a room heated to 20 degrees Cent. When dry, the plate is coated in the ordinary manner with thin normal collodion, and, five or ten minutes afterwards, when this has set perfectly hard, a second coating of thick collodion, made up according to the following formula, is placed upon it:—

Ether	100 grammes
Alcohol... ..	100 "
Gun-cotton	2 to 6 "
Castor oil	4 "

The castor oil is an indispensable constituent of this collodion, for upon it depends the whole value of the process. It imparts suppleness and strength to the collodion, and prevents the latter from becoming shrivelled. From some cause or other, for which no chemical reason can be assigned, it is found that if the castor oil penetrates into the sensitive material, the employment of repeated applications of boiling water is necessary for washing and developing the picture. It is on this account that a thin film of collodion namixed with castor oil is first applied as a preservative to the sensitive material.

To avoid the employment of two films of collodion, the coating of thick castor oil collodion may first be applied and allowed to dry, and then the sensitive mixture superposed: in this case no fear need be entertained of the castor oil doing any harm, but great care must be taken to employ glass plates of the most even and uniform description, placed upon a perfectly level surface, so that the film of collodion is of the same thickness throughout. An irregular coating of collodion will militate against the perfect removal of the film, which refuses to leave the plate in those parts where the material has been insufficiently applied.

Either of these methods may be followed, according to the description of pictures that are desired. The first is applicable to the production of prints required on a thin film destined to be mounted upon cardboard or upon glass, or of dull unglazed pictures, in which case the film of collodion is dissolved away, in order to remove the brilliant surface. This is best done by mounting the print, when it is thoroughly dry, upon cardboard or glass, and dipping it into a solution containing alcohol and ether in equal proportions. The pellicle of collodion is dissolved, and the print remains adherent to the cardboard or glass: the operation must, however, be closely watched, in order that the print is removed as soon as the collodion disappears, as a prolonged sojourn of the photographic image in the alcohol and ether has the effect of detaching the picture from its support. The ether and alcohol in which the collodion has been re-dissolved may be subsequently used for the manufacture of collodion by adding thereto a certain quantity of gun-cotton.

The second mode of operating is useful for obtaining prints upon a thick film of collodion, which are to be used unmounted without any support, and for preparing fabric for photographic purposes. The fabric is prepared as follows:—A piece of fine linen or cotton cambric is moistened with alcohol, stretched upon a glass plate, and pressed by means of a roller, to expel the air-bubbles. When it has been well pressed against the glass, it is covered with a film of castor oil collodion, and allowed to dry. The sensitive carbon mixture is next applied, and, when this is per-

fectly desiccated, the whole is removed from the glass plate.* This prepared fabric is very suitable for photo-paintings and for enlargements; for the latter purpose photographers will find it especially applicable, as being very economical in its employment, and successful and permanent in its results.

It has been stated that the carbon process is less costly than the ordinary silver process. This statement is easily proved by giving the cost price of the sheets of *collodion-cuir* and prepared fabric as manufactured and sold at the author's establishment. A sheet of prepared carbon paper ready for manipulation in the pressure frame or upon the screen for enlargements, which is sold for rather more than three shillings, costs from one shilling to fifteen pence to prepare, according to the thickness of the collodion film.

But to proceed with the process. As soon as the sensitive film has been prepared, as has been described, upon a thin transparent pellicle, the sheet is placed under the negative, taking care that the collodionized surface is put in contact with the cliché. After a sufficient exposure, which varies according to the intensity of the light, but which is always much less than that required in the ordinary silver process, the print is placed in a bath of warm water in a dark room, and afterwards dried and mounted.

One of the principal features of the process is the possibility of imparting to the *collodion-cuir*, if necessary, the dull opaque appearance of ground glass, by means of which the necessity of backing is dispensed with in stereoscopic slides and pictures of that description. The specimens exhibited by the author sufficiently showed the value of this modification. The unglazed surface of the film allows of painting and retouching of every description, and no glass mounting being required for transparent photographs, their weight and expense are much diminished.

The author accompanied his remarks by a practical demonstration of the process. He applied the sensitive material to the surface of a plate; detached another film prepared some time beforehand, and developed in warm water three prints, of which two were stereoscopic on dull collodion, and the third a large transparency. The experiments were exceedingly successful, and were watched with great interest.

ON THE PRESERVATION OF COLLODIONIZED PLATES IN A MOIST CONDITION.

BY GENERAL MONGIN.†

At the special request of a member of the Society, I have much pleasure in communicating the details of a method, recently employed by myself, of working with wet plates which had been preserved and exposed to the vicissitudes of travelling in a grooved box constructed for the purpose. The process (if process it can be called) is based upon the fact that if a plate coated with collodion in a certain manner, which I will hereafter indicate, be carefully washed after its exit from the sensitizing bath, and afterwards placed in a bath of pure water sheltered from the light, the collodion will remain perfectly adherent to the glass, provided the water surrounding it is not violently disturbed; moreover, the prepared plates lose but very little of their sensitiveness in this condition. In making this statement I must frankly admit that I cannot speak for certainty of a longer period than ten days, as I have myself never kept plates for a longer time; the only thing to be observed in working the process is to add to the developer a few drops of nitrate of silver solution to replace that removed in the operation of washing.

The Collodion and Silver Bath.

First of all it is necessary for me to state that when speaking of the employment of water, I always mean rain-water;

* We are at a loss to understand how the linen prepared in this manner is to be printed, as the treatment with alcohol would scarcely render the fabric transparent.—ED. P. N.

† Read before the French Photographic Society.

not but what ordinary water would no doubt give similar results to those I have obtained, only I have never experimented with it. Next with regard to collodion. The material I use is that iodized and bromized with cadmium salts only, and sensitized in a bath prepared with re-crystallized nitrate of silver, and not containing even a trace of any other metallic salts than those of silver and cadmium; that is to say, the bath should be one that has never been employed for sensitizing collodion of any other description than the one I have indicated, for otherwise it would most likely contain small quantities of nitrate of potash, ammonia, &c., derived from other collodions. If this matter is not strictly cared for the process will be unattended by success, as the plates will become fogged at the moment of development, or be otherwise rendered unserviceable.

Cleaning and Coating the Plates.

The plates are cleaned and coated with collodion in the ordinary manner, but care should be taken in this, as in all other processes, to collodionize the plates in a room of the same temperature as that in which they were cleaned, otherwise a deposition of moisture, imperceptible to the eye, may be formed, which prevents the adherence of the film.

Washing the Sensitized Plates.

The plates are sensitized in the regular way, and, on leaving the bath, carefully washed. This is done by holding the plate at one of the corners, and allowing a small jet of water from a wash-bottle to play over the back and front of it; it is then passed carefully into two or three baths of pure water in succession, remaining a few minutes in each, and finally placed in the grooves of the water-box. This box should previously have been put into its bucket, or outside covering, which is filled with water to within an inch or two of the top. To introduce the plate into the box, the collodion face should be turned towards the bevelled part of the groove, and so manipulated with the hand that the surface of collodion does not become injured at the edges; the same precaution is necessary in withdrawing the plates from the box.

The water baths will serve for the preparation of twelve or fifteen plates before they require to be renewed.

Carriage of the Plates.

The plates are now ready for use, and, when the lid of the water-box has been closed, and the cover of the bucket containing it adjusted, they may be transported without the least inconvenience. The fluctuation of the water in the bucket, caused by movement during transit, is broken against the sides of the box, and is not transmitted, therefore, to the interior, and the plates are thus kept immersed in a liquid in a state of perfect repose. I have contemplated the feasibility of replacing the water in the bucket by an accelerative bath, either of nitrate of silver or tannin, or some such substance, but as my process is merely for landscape work, there would be no advantage in a proceeding of that description; besides, the employment of tannin, or of any material susceptible of fermentation, would bring about mildew, and possibly give rise to other evils.

Exposure.

In operating, I first fix my camera in the proper position, and then focus my picture. When this has been done I place myself in the dark, and withdraw one of the plates from the box. Everybody has his own peculiar style of dark tent; mine is simply a bag of dark stuff rather more than a yard in diameter, which I pull over my head, kneeling down in such a manner that the sides touch the ground in every part. By the aid of a light furnished with a yellow shade I am then able to perform my operations as well as in a laboratory. The exposure required for plates of this description is about two or three times that necessary for ordinary wet plates; four times the ordinary exposure may even be given, as the plates, being free from nitrate of silver, rarely evince symptoms of over-exposure. After withdraw-

ing the plate from the camera it should be returned to the box with the same precaution as before, the development being effected on the return home, either on the same evening or on the morrow.

Development.

The operation of development requires the most careful attention, a strict adherence to the following rules being necessary to prevent the formation of stains and markings, which are otherwise often obtainable in this method of working. I prepare, first of all, two solutions compounded as follows:—

No. 1.—Nitrate of silver	...	...	4 grammes
Citric acid	...	...	4
Water	...	...	100 cub. cents.

This solution will keep good for an indefinite period. A white crystalline deposit will be formed at the end of two or three days, but this may be allowed to remain at the bottom of the bottle, as it exerts no influence upon the liquid.

No. 2.—Pyrogallie acid	...	...	15 grammes
Alcohol	...	...	100 cub. cents.

The acid is dissolved in the alcohol, and the solution filtered. This liquid may also be kept for a considerable period.

Pyrogallie Acid Bath.

This is very easily prepared from No. 2 solution. Ten cub. cents. of the latter, and a like quantity of acetic acid, are added to 200 or 250 cub. cents. of water, and the whole well shaken. It will keep in good condition for a fortnight or three weeks.

The operation of developing is conducted in the following manner:—Two small glass vessels are taken, and into one of them (which we will designate No. 1) are poured a few drops of the No. 1 solution. The other vessel (No. 2) is then filled with liquid from the pyrogallie acid bath, a proportion of the latter being afterwards transferred to No. 1 vessel. The negative is carefully withdrawn from the box,* and covered with the pyrogallie acid solution contained in No. 2 vessel; this operation is indispensable to the production of clear negatives. Subsequently the liquid in No. 1 vessel is applied, and the development proceeded with in the ordinary manner.

The image is sometimes three or four minutes before it becomes visible, but when once apparent it develops with great regularity. When the operation has been carried sufficiently far, the plate is carefully washed by means of a wash-bottle, and fixed with cyanide of potassium. The subsequent manipulations require no special description, and are carried out in the ordinary manner.

REMARKS UPON THE WET COLLODION PROCESS.

BY MR. MCLACHLAN.†

THERE is now the silver bath, upon the proper preparation of which everything depends; it is, in fact, the foundation of the whole process, to prepare which, obtain, if possible, a rather dirty-bluish-looking crystal, transparent, and quite neutral; dissolved in distilled water, it deposits whatever is mechanically held in the crystals, and is afterwards quite clear in solution. I believe it to be the most neutral of any, and the only kind free from nitrite or acid; this silver is best for any bath, especially after a day's sunning in concentrated solution; there is no other which gives the same firm pictures for such a long time.

This silver can be obtained from Johnson and Son. To prepare the bath, take 1 oz. of the silver described to 1 oz. distilled water, place whatever quantity you prepare in the open light—the most actinic part of the year is the best, say from May to the end of July; this length of time is quite long enough, even with Manchester light. This silver, by lengthened exposure to light, has the power of dissolving and keeping in solution a great quantity of oxide of silver; from some experiments I am now making I think the stopper should be very loose in the bottle.

* The hands should be perfectly clean when manipulating with the plates in the box.

† Continued from p. 247.

It is very likely the change might be quicker brought about if the silver was dissolved in a greater quantity of water. After sunning, filter; then take a solution of caustic potass, strength 1 grain to 1 oz. water; add one drop of this to every ounce of silver in strong solution; more potass than this will take away, to a certain extent, that perfect modeling that is peculiar to this bath, and no other; allow the potass to remain in the concentrated solution from one to three days, of course not in the light. Now, for every ounce of silver take two or three drops of the strong solution in a glass measure, in another measure dissolve 2 grains iodide of potassium in a few drops of water; add to measure No. 1, stir and wash well; add this iodide of silver, which will have a slightly green appearance, to strong solution (this is 2 grains to every ounce silver); let this rest about an hour, then add distilled water, to make up to 35 grains to ounce; this addition of water will not precipitate any iodide, that is if the silver in the first instance has been sunned enough; if not there will be more or less precipitate, according to the effect the light has had upon the silver: this never happens when the silver is sunned three months, but will often in a shorter time. When it does, sun again for a day or two, and filter. Remember, the bath is not in a proper condition unless it keeps quite clear when the water is added. After a few days in the fully sunned bath, the great excess of iodide will be suddenly precipitated, still leaving the solution clear; filter this out, and never after does this bath want anything doing to it, whatever the quantity may be, and however long in use; much water could now be added to it without causing the slightest precipitate. A bath that keeps clear has the power of dissolving and keeping in solution a much greater quantity of oxide of silver than the one that the precipitate is from. It is this quality that gives it its value, and is the foundation of the whole process; without it you cannot neutralize your collodion; for with a bath that goes milky you are liable to get the plates fogged; indeed you most certainly will, after a few trials. The other takes away the possibility of this, because of its power instantly to dissolve any alkalinity. This is its great virtue, and keeps everything right; the quality of the picture is maintained for a very long time, quite out of all proportion to any other bath that can possibly be made. Want of quality will at last arise from this power becoming partly exhausted, but it is never wholly so. In this state the iron should give an excess of half-tone; the drop of weak potass is added to the strong solution for two reasons—first, to neutralize any free acid that might not have been detected in the silver; secondly, to give it a faintly alkaline reaction, so as to cause the collodion to harmonize with it when rectified with the potass. If transparencies are wanted, sun until you get the density wanted. They will be absolutely perfect in half-tone and clearness. After once obtaining silver in the proper condition, a drachm, or even one drop of it, can be tested with a weak standard solution of potash; the amount dissolved will be a guide for preparing it in the same state at any other time, although three months makes a bath that will allow any number of plates to be taken in it without breaking down in any way, nothing exhausting it but the silver becoming so low as not to cover the plate. It may be used every day, never gets in the least greasy when the collodion is properly tempered to it; in fact, you can never injure it by the ether and alcohol from the plates. A few days' very actinic light will give you a very good bath, but not to be compared to the first. Every kind of silver that I have obtained, however pure so far as appearance and guarantee is concerned, is acted upon by light at any time of the year, to a certain extent. I am quite sure that the condition of the silver is everything; for instance, if you take the same neutral silver-salt, dissolve 6 oz. in 6 oz. distilled water, and drop into it one drop of weak potass solution, you take from it, to a great extent, the power of exchanging in light; every drop added makes it less changeable. Pictures taken with this silver want firmness; the bath breaks down immediately. If nitric acid is added, even the thousandth part of a drop, there will be greasiness in development; the more acid, the worse the bath becomes, for no developer will lie even on the plate. After the acid, the pictures, as long as you can get any, will be very soft; before the addition of acid, and according to the amount of potash, they would want half-tone, though they will be quite clear.

Now take another silver that has an opaque look, and that you suspect to incline to alkalinity; drop into the 6-ounce silver as before (say) two drops weak nitric acid of the strength of 1 drachm to 6 ounces of water; place this in the light; but

first test if it is neutral; and although it appears so to test-paper after sunning, test again, and you will find an acid reaction, the light in some way developing the acid, or, at any rate, causing it to indicate its presence, while before it was disguised. A bath made from silver in this state would give streaky pictures, and would not be acted upon so quickly by the light; by this you will see the silver should be quite neutral without any addition to make it so, unless pure oxide of silver would answer to neutralize any acidity; this I have not tried. What causes greasiness in a bath is not the accumulation of alcohol and ether, for a new bath will often be found in this state, and ought to be sufficient to prove this. The true cause is a certain amount of acid—alkaline base and alcohol—forming a kind of fusel oil, so that you will see to work this bath it is essential that no free acid shall be allowed to be in it, more especially that kind of acid which arises from pyroxyline, which is made by an excess of sulphuric acid. It is this peculiar acid which causes streaks in the direction of the dip, brain markings, &c.; spots arise, but not always, from the solvents being too strong. This kind of collodion is the best, nevertheless, for the present method of working. Most defects are easily remedied by the weak potash solution. I like the collodion, in the first instance, to be pretty deep in colour, not old. I use Mawson's. When very bad, the best way is to make the collodion slightly alkaline; take 2 drachms, or thereabouts, of another old collodion free from these imperfections, and add 6 oz. of the alkaline kind; this is almost certain to put things right. Hardness and other imperfections cannot now be entered into; any neutral collodion that gives good pictures will do for my bath. I cannot give a better practical illustration of the cause of greasiness in the ordinary nitrate bath than the experiment with the iron solution; for the alcohol and water never become homogeneous in the iron until the alcohol is made slightly alkaline.

It is advisable when the nitrate bath has been long in work, and the picture is inclining to be hard, to expose well, redevelop, but very little, with the iron in the dark room, finish with pyro in the light—2 grains to 15 drops glacial acid; this gives more brilliancy under such circumstances. Baths that are old have another peculiarity. Suppose you were to apply a developer at 70 deg. temperature, you would get hardly any picture, and a fogged plate; the amount of alkaline base in the bath seems to decompose the developer; fix with cyanide or hypo; wash very well. There are more negatives spoiled through careless washing than is supposed.

I believe the action on silver might be much hastened by placing it in shallow dishes or cells, and concentrating light upon it by reflectors or lenses. I have an idea that it might be charged at once with perfectly pure oxygen or ozone, for I believe it is oxygen changed by light, and absorbed by the silver, that is the cause of its peculiar condition. Silver in this state answers much better for the printing-bath, keeping clear much longer, and giving more brilliant prints; and as it has the power of holding oxide of silver in solution, all acidity can be effectually destroyed, which leads me to hope much from it as a means of preventing prints from fading, especially if they were allowed to remain a short time in a very weak solution of caustic potass dissolved in alcohol.

If a definite crystal of silver was chosen, it would act as an actinometer for measuring the amount of actinism in light of different colours. Very long exposure would be necessary in deep yellow, red, or blue dishes; the amount of actinism all over the world might be registered: as a certain exposure to light will only dissolve a certain quantity of potash, a scale could easily be graduated to indicate the differences between one quarter of the year and another. My theory of the latent image is, that the iodide is oxidized; I could bring many proofs to support this.

Remarks upon what is to be most attended to in working this process.—Be sure the collodion is neutral, for as long as you keep out acidity the bath will never get greasy, nor even want filtering, unless from pieces of collodion falling into it. Never try a new collodion in this bath, use an old one for this purpose, and never add any silver to it unless it is of the same kind. For baths partially sunned, take a 6-ounce bottle, place in it about 3 drachms old collodion free from imperfections, fill up with the neutralized or slightly-alkaline collodion; this should leave it about a sherry-colour. A bath used with collodion in this state will want sunning often, and filtering often, from the acidity of the collodion causing a precipitate of iodide of silver. This happens more to a sunned bath than any other. What-

ever you do, keep out nitric acid, or you will certainly have plates that the developer will not lay upon. There are other peculiarities belonging to a partially sunned bath that would take too long to describe.

To reintensify, take 7 grains iron, 14 grains citric acid, to 1 oz. water; make several Winchester quarts of this, as the longer it is kept the better it gets, and is not in good condition for at least two months. To each Winchester add 3 drachms glacial acid; weaker iron makes the picture whiter in the face, stronger, greyer, and develops more. Here again the different kinds of iron give different results. The iron that remains clear a long time when dissolved gives the strongest picture, that which dissolves the most milky gives the most half-tone suitable for a very hard collodion.

There is a pyroxyline that will act the same part in the collodion that the sunned bath does in dissolving oxide of silver. I expect soon to accomplish this by exposing certain kinds to light in different ways. I had prepared everything for these experiments last year, but was so exhausted by continual experimental testing of what I had accomplished, that I was afraid to begin a series of experiments, that would require an almost endless proving, between bath, collodion, and developer. To prove with certainty a success, even if obtained, when I accomplish this my original idea, then it will be impossible to fail but by gross carelessness. Until this is done, the process will be imperfect, as I consider doctored collodion and all others only temporary experiments. With a collodion made from such gun cotton and my bath, you will not be able to obtain any iodide of silver but the proper kind. At present this is not so. The rapidity will be something extraordinary, as I know from the few successes I have obtained. To accomplish this has been the object of all my aims, and I have failed; but it has been to me the hidden treasure, and has given me an experience that could not possibly be obtained otherwise. From these experiments I have learned that bromides are injurious in making a perfect collodion, and that they are not necessarily more sensitive to coloured light than the iodides; in fact, they are highly injurious for perfect working.

Understand distinctly that I am only giving the natural action of each chemical; for it must not be expected that an iron, the character of which is to give soft pictures, will do this when the collodion has not the quality of giving half-tone; but it will favour it all that is possible. If the collodion is tame, the iron that dissolves and keeps clear, and gives a vigorous picture, can only help it; but it will never do the work of the collodion; what is wanted is harmony; and if this is not attained, no chemicals, however perfect, are of any avail in giving constant success. Success depends much more upon the condition or state of chemicals than their perfect purity. I know of no chemicals, however pure, that can be obtained with any certainty twice alike; their conditions are different; and unless this is taken into account, there cannot be certainty of results. I have nine different bottles of silver in the light. There are three distinct kinds, three bottles for each; one of each kind with saturated solution, another with twice the amount of water, the third with three times as much. I mean to put out more silver differently prepared, so as to make sure of the best method of preparing it.

This paper will not allow me to say enough of collodion to be of much value. I have not gone deeply into any part of the process, as I think the information wanted can be best brought out in discussion. The majority of facts here stated were known to me many years ago; my difficulty was to harmonize them.

Well knowing the odium that must fall upon me should I fail to accomplish all I say, I have put the whole to the test in daily practice for two and a half years, and I again assert that I am not only willing, but most anxious, to be put to the proof, as no argument will ever decide anything. This I expect will be done by the London Photographic Society. This is not the time to state how much I have sacrificed to obtain this knowledge, nor the motives that bear me up against an opposition that I felt certain I should have to encounter. I trust it will be admitted that I have so far performed all that I promised; and I have not accomplished this much without an expense that should at least place me above suspicion. I ought to know my business; for I believe there are few, if any, in Europe who have had the same amount of experimental practice; and for any one to assert that the common process is at all like mine, or could be made with any amount of skill to give a continued certainty and quality that I state mine will, is a great mistake.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Tuesday evening, the 26th inst., at the Free Public Library, William Brown Street, the President, Rev. G. J. BANNER, in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. FORREST laid on the table a number of pictures taken lately at Bettws-y-Coed, upon plates prepared by the Liverpool Dry-Plate Company, and stated that out of the whole number he had exposed he had not had a single failure. The development was effected by means of a weak solution of ammonia applied to the plate for a longer time than usual.

An animated discussion arose as to the relative advantages of weak and strong ammonia for developing, Mr. Mawdsley advocating a rather strong solution, and other members upholding the weak.

Mr. HUGHES said he had exposed a plate at Eaton Hall, the image upon which was perfectly visible before development.

Mr. MAWDSLEY said that it was a very frequent occurrence with over-exposed plates. He said he had noticed it in a marked degree upon a plate he had exposed for an interior when the window was well out, before developing.

Mr. GREEN remarked that since collodio-bromide had come into use very little was heard of comets.

Mr. MAWDSLEY said he had never, with collodio-bromide, met with a single instance of the old tannin spot, round, and transparent, with a black nucleus.

Mr. FORREST exhibited a piece of glass which had been exposed to light for over three years in the window of a church, part of it covered with paint, and pointed out the marked change which had taken place in the colour of the exposed part, it having acquired a decided pink tone. After explaining the cause of the change of colour, he touched upon the importance of having photographic lenses, especially those exposed to a concentrated light in enlarging, free from any cause of change of colour.

Mr. HUGHES said he had a pair of portrait lenses by Ross, one of which had been much used for enlarging, but no change had taken place in its colour, as it worked as rapidly as the other, which had never served that purpose.

Mr. WHARMBY said the change of colour in photographic lenses was generally attributed to the Canada balsam used in mounting them.

The PRESIDENT said he had great pleasure in announcing that Mr. Green had offered two more of his large photographs to the Society to be disposed of as follows:—One to be presented to Mr. Sayce in recognition of his efforts in perfecting the collodio-bromide process; the other to be given as a prize for the best collection of twelve stereo pictures, to be exhibited at the July meeting.

The cordial thanks of the meeting having been tendered to Mr. Green,

Mr. HUGHES made some remarks upon "Enlarging." He said he had brought all his apparatus with him for the purpose of practically illustrating the enlargement of microscopic objects, but owing to his inability to procure a dark room he was unable to do so. He, however, exhibited his apparatus, and explained the method of applying it, calling particular attention to the fact that the focussing was done upon the surface of a piece of white cardboard instead of through ground glass.

A discussion arose upon the subject of ground glass, &c., for focussing, and Mr. FORREST promised to show at the next meeting a specimen of a new sort of dull glass, which he thought was just the thing required for fine focussing.

A vote of thanks having been passed to Mr. Hughes, the second excursion was discussed, and it was decided to go to Llangollen on the 22nd of June, the President kindly inviting the members to dine with him upon that occasion.

Correspondence.

SEL CLEMENT.

DEAR SIR,—It is a very easy matter (but deserving protest which I offer), to attribute to an adversary absurd allegations. Where did the "Analyst," in your pages, find that I pretended to classify hydrochloric or nitric acid in the organic chemistry, because they contain hydrogen or nitrogen? That suggestion can be, without difficulty, returned against himself. Is carbonic acid or oxide of carbon classified amongst organic bodies, because containing carbon—*matter sine qua non* (as he said) in every organic substance?

Carbon is not the exclusive matter constituting those kinds of bodies; hydrogen or nitrogen (as I say), often both (oxygen, of course, frequently), are necessary, in simultaneous presence with the carbon, for building every organic matter. All chemists and all authors are unanimous in that doctrine. Also I said, and again repeat, the apparatus was not properly arranged for demonstrating the presence of organic principles.

Because the "Analyst" obtained a precipitate of carbonate of lime with a piece of sugar, and did not succeed the same with the Clement Salt, he concludes to a deficiency of carbon! I there stop him. He supposes, then, the analysis of nitrates (containing some other reagents) must be conducted by the same way as the analysis of a piece of sugar. I must exclaim there, as he does: "Impossible!"

Did the learned gentleman not know that alcohol, ether, spirit of wood, acetic acid, &c., will go through his apparatus without being decomposed and without precipitating lime water? Nevertheless, the above-mentioned matters are certainly organic, and doubtless very rich in carbon. Meanwhile, starch, gums, resins, sugar especially, will be suddenly, on the contrary, decomposed, and give the characteristic precipitate in lime water, but characteristic only with those kinds of substances.

Now, being complaisant as possible, I will admit the heat was sufficiently strong in the combustion tube to decompose the Clement Salt in its immediate principles. Then I must repeat what I have stated in my last letter:—

"The nitrous red fumes have probably altered the little quantity of carbonic acid present in a nascent state, because the free oxygen taken partially for the oxidation of the carbon had found sufficient quantity of hydrogen to produce water." In the present case, where is the supposed oxidizing atmosphere? What will disturb, also, the reconstitution of the hyponitrous acid in nitric acid, taking one equivalent of oxygen from the nascent carbonic acid, and showing consequently oxide of carbon? Every day, and in every furnace or closed apparatus, we notice that phenomenon; viz., production of oxide of carbon at the expense of the carbonic acid by deficiency of oxygen. And what will be the matter with the nitrogen, laying aside that included in the nitrates, if some proportion of the Clement Salt? It will certainly be acid of oxygen.

In my special case I am compelled to declare the apparatus was not well adapted for a public analysis, the tendency of which was evidently, if not willingly, to pull down my recent industry, and which was presented as a challenge to the manufacturer of the Sel Clement. For such serious matters something more correct, something fulfilling better the purpose, must be presented, I think, to the scientific readers. Whatever remains of the chemical lesson given by the "Analyst" to the maker of Sel Clement, only his final assertion: "The nitrate of magnesia and a great amount of water are the essential compounds of Sel Clement." "It is virtually conceded," he said. Where has the "Analyst" read such a concession? I wrote in my last letter that part of the magnesia was very exaggerated in the newspapers. I can easily offer the proof of it, sending to him a salt producing exactly the same effects as the Clement Salt, and containing only 2 per cent. of nitrate of magnesia. With regard to the water, the Sel Clement contains strictly its water of constitution, and the proof of it, easy to verify, is its quick decomposition, drying it more on the fire.

Dear sir, some other matters, till now not discovered, are present in the Clement Salt. Those matters—organic, of course—losing reductive power with the silver salt when dissolved in certain reagents—although in a very minute proportion—are not the less important in the mentioned product.

In the same number of your estimable Journal in which I found the letter of the "Analyst," you have a striking example

of such phenomena. The first paragraph of "Talk in the Studio," entitled "Sugar in the Printing Bath," records a curious fact of an organic substance losing its reductive power, although in contact with nitrate of silver, in despite of scientific assertions. Adding some alcohol—organic and carbonic matter—the same phenomena persist.

Let me conclude in few words. The public certainly will be indifferent to a more prolonged doctrinal discussion, which I have not sought, and which obliged me to be disagreeable to the "Analyst," defending my right and my industry. Amidst all that noise and such contradictions, the direct and personal experiment of the photographers will be the only right and true criterion of the economical and technical properties of the Clement Salt. To the photographers I commit my product, if, as I hope, its French origin shall not be a stigma of reprobation amongst the employers of Rivo's albuminized paper. Chemistry is, like all sciences, a cosmopolitan one, without native soil.

THE MAKER OF THE SEL CLEMENT.

Paris, 13th May, 1868.

INJURY TO NEGATIVES BY VARNISHING.

DEAR SIR,—There is one little piece of manipulation which may possibly be of service to some beginners in photography. Some year or two since, when varnishing my negatives, I was very frequently troubled with the varnish causing the dense parts of the negative to become extremely coarse and granular. Under a microscope, the appearance was as if the density was broken up and gathered together in granules, large and small. The consequent picture was very coarse indeed, and thoroughly unsatisfactory. Various samples of varnish brought the same disaster, and I was compelled to take to an aqueous solution of gum arabic to get the film to give me a passable positive. I at the time intensified with pyro, citric acid, and silver, preceded by the solution of iodine and iodide of potassium.

I am quite satisfied that using too much silver is one cause of this coarse deposit; but I have reason to believe there are others, as it has occurred when no excess of silver was used.

This continued for some time, and I could get no cure for the evil, when one day I attempted to intensify further a negative rather weak, with a varnish which contained a small portion of tincture of iodine, recommended by Mr. Jabez Hughes. Much to my surprise and delight, on the application of this, the negative resumed its normal state; the coarseness disappeared; and since then I have never failed in curing this evil by a similar application. The negative will, of course, be slightly further intensified by the treatment, which may, or may not, be a benefit; but I was glad to get rid of the coarse deposit at all cost.

Any one troubled with the annoyance, may safely try this remedy; it will not harm his negative much, if it should not cure.

As I have very often indeed been greatly benefitted by sundry hints in the pages of the News, I owe it to mention this, as I do not remember having seen it stated anywhere.—I remain yours, &c.,

KENT.

May 19th, 1868.

Talk in the Studio.

ACTINISM *versus* ILLUMINATION.—A curious illustration of the distinction between the actinic and the luminous quality of light recently brought under our attention by Mr. Rejlander. A few days ago he was producing a portrait in the open air, a little after seven in the evening. The setting sun, low on the horizon, illuminated all objects on which it shone with a yellow glow; whilst the opposite arch of the sky was bright clear and blue. On examining the sun-illuminated image on the ground glass, Mr. Rejlander was struck with the fact that the side which was practically in shadow was much more actinic in colour, and expressed a conviction that the side of the face on which the sun shone would, in the picture, be the darkest side, and the opposite and apparently shaded side the lightest. Singularly enough, such was the result, and a print of a very fine portrait, now before us, illustrates the odd phenomenon of sunlight being represented by shadow, and reflected light producing the actual lights of the picture. We have seen clever paintings of candle-light effects, in which one half of a face is brilliantly lighted by a candle or lamp, the other relieved from

perfect blackness by the bluish grey light of the moon, or of twilight through a window. Such pictures would in photographic reproduction probably yield a result as we have mentioned; but it is very rare that a scene in nature would be so represented.

SALE OF POISONS.—A Bill has recently been laid before the House of Lords by Lord Granville which may possibly affect all dealers in photographic chemicals. It proposes to enact that after the 31st of December, 1868, no persons shall keep open shop for retailing, dispensing, or compounding poisons, or use the title "chymist" or "druggist," unless he is a pharmaceutical chymist, or was before that date in business as a chymist and druggist keeping open shop for compounding prescriptions, or has for two years before the passing of this Act been apprenticed to a chymist and druggist, or at the time of passing this Act, being of full age, has been actually engaged in compounding prescriptions as an assistant. An annual register of qualified persons is to be issued. Poisons are to be distinctly labelled. The Bill, as at present proposed, is not to extend to wholesale houses, or to sales for use in photography, or to patent medicine vendors, or to qualified medical practitioners or veterinary surgeons. Chymists and druggists are not to be liable to serve on juries. The following are to be declared poisons:—Arsenic and its preparations, oxalic acid, prussic acid, chloroform, cyanides of potassium and mercury, strychnine, and all poisonous vegetable alkaloids and their salts, aconite and its preparations, emetic tartar, corrosive sublimate, belladonna and its preparations, essential oil of almonds, unless deprived of its prussic acid, cantharides, and savin and its oil. Those interested should keep an eye on the matter to see that clauses are not introduced, in the passage of the Bill, which may curtail the proper trade facilities in vending various chemicals.

INFLUENCE OF THE SHAPE OF THE APERTURE IN STOPS.—Mr. Rejlander has recently brought under our attention a very curious illustration of the influence of the shape of the aperture in the stop employed with a lens. The picture is a pretty open air group, with trees in the background. Photographers will have noticed that the light passing through the apertures of foliage which is out of focus assumes the form of numerous white discs. In the case in question a square aperture was used instead of the circular hole commonly employed, and here the light spaces between the foliage which is out of focus consist of so many square white patches instead of the usual white discs.

ROYAL SOCIETY OF MEDICAL AND NATURAL SCIENCES OF BRUSSELS.—The chemical prize of this Society has just been awarded to an Englishman, Dr. T. L. Phipson, F.C.S., of London, for a paper "On the Application of certain Optical Properties of Bodies to Chemical Analysis." Dr. Phipson's name is known to our readers as a frequent contributor on the chemistry of photography.

RE DISDERI AND COMPANY.—An application was made a few days ago, before Vice-Chancellor Sir R. Malins, for the appointment of a provisional liquidator under the 80th section of the Companies' Act and the general orders. Mr. Disderi, having establishments in Paris and Spain for the carrying on a superior photographic process, had endeavoured to form a company in this country, but without success. The seven shareholders and directors had paid nothing, and creditors were suing Mr. Disderi. Under these circumstances he had presented a petition himself, and now asked *ex parte* for the appointment of Mr. George Augustus Cape, the well-known accountant, to be appointed liquidator until the hearing of the petition. The Vice-Chancellor made the order.

INDECENT PHOTOGRAPHS.—On Tuesday, at Bow Street, John Dukes was charged with selling indecent photographs. The prosecution was conducted by Mr. Sleight, the barrister, instructed by Messrs. Pritchard and Coletto, solicitors to the Society for the Suppression of Vice. The "cartes" had been purchased by Willis, an agent of the society. The defendant said they were artist's photographs, and not indecent. Mr. Flowers said they were not so bad as many which, unfortunately, it had been the duty of the magistrates at this Court to deal with; still they were decidedly indecent, and it would be for a jury to say whether they believed that such productions could have been intended for the use of artists or for any innocent purpose whatever. He should commit the prisoner for trial. Sophia Dukes, wife of the last prisoner, was committed on

similar evidence for selling photographs decidedly more offensively indecent than those purchased from her husband. Mr. Abrams, who defended her, said she was acting under the direction of her husband, and on Mr. Sleight expressing his dissent, Mr. Abrams said the learned counsel would have taken that view if he had been acting for the defence. Both prisoners were bailed in two sureties of £20 each.

COPYRIGHT IN PHOTOGRAPHS.—*Strahan v. Graham*—Vice Chancellor's Courts, May 30.—In this case, the details of which will be within the memory of our readers, Mr. Strahan, the publisher of *Good Words*, purchased from Mr. Graham the right to engrave certain photographs of the Holy Land, to illustrate articles in *Good Words*. Mr. Strahan also published the engravings in a volume called "Eastward" in a separate form, and an injunction was obtained to restrain him. This order was appealed against, but confirmed on appeal. It appeared that 1,300 copies of the work had been sold, and it was referred to Chambers to ascertain the amount of damage sustained. The Chief Justice was of opinion that 2½ guineas was a fair sum to be allowed for each photograph. One party appealed against this view, and the other side moved to have the photographs delivered up. The Vice-Chancellor said the question ought never to have been raised, and dismissed both applications with costs.

ELASTIC AND SWEET GLUE, which does not spoil, is obtained as follows:—Good common glue is dissolved in water, on the water bath, and the water evaporated down to a mass of thick consistence, to which a quantity of glycerine, equal in weight with the glue, is added, after which the heating is continued until all the water has been driven off, when the mass is poured out into moulds, or on a marble slab. This mixture answers for stamps, printer's rolls, galvanoplastic copies, &c. The Sweet Glue, for ready use by moistening with the tongue, is made in the same way, substituting, however, the same quantity of powdered sugar for the glycerine.—*Druggists' Circular*.

PHOTOGRAPHING THE INTERIOR OF A TUNNEL.—Mr. Evans has presented to the New York Institute of Engineers a photograph of the high level tunnel of the Central Pacific Railroad. The east end of the tunnel being sometimes illuminated at sunrise, a large mirror was employed to reflect the sun's rays equally over the whole of the interior while the picture was being photographed. The plate having been exposed about fifteen minutes, a print was taken showing every detail, even to the timbering of the drifted headings, with great distinctness and accuracy.—*Scientific American*.

SUICIDE WITH CYANIDE.—A few days ago an inquest was held on the body of William Augustus Barnes. The deceased had been engaged at Drury Lane Theatre as pantaloone in a pantomime last Christmas, since which time he had taken to photography. A *post-mortem* examination of the body showed that death resulted from taking cyanide of potassium.

ORNAMENTING WINDOWS IN STUDIOS.—A correspondent of the *Scientific American* describes how he treated the window of his dark room, which communicated with his studio. He says: "Thinking I would make it ornamental, I procured a pint of stalo alo, four ounces of Epsom salts, and a small vial of magenta-coloured liquid. I then took out the window, and in its stead placed a large single pane. After mixing a saturate solution of the ale and salts, and adding the colour, I filtered the solution, then cleaned the glass with alcohol and cotton chemically clean, placed it on a levelling stand, and made a small ledge with putty around the edge, then poured on the solution enough to cover the plate evenly in all parts. In a few hours the crystals began to form around the edge, and in forty-eight hours it was all covered with the most beautiful crystals, of large size and of a rich purple colour. When it was perfectly dry I placed it in the window, where it remained all summer, and was the wonder and admiration of the curious. But when winter came, and the stove was put up close to it, it soon began to lose colour, and the crystals gradually dropped off."

A WONDERFUL PHOTOGRAPHIC SECRET.—A singular advertisement recently appeared in the *Times*, to which we give a gratuitous publicity in the circles where it may be interesting. We quote it verbatim: "The secret of different modifications of a photographic collodion wool, produced exceedingly cheap, by a new and easy proceeding, is to be sold, for a sum of £3,000. Certificate from the Russian Technical Society, and from the Photograph of the Imperial Court of St. Petersburg, as well

as specimens that will distinctly show the manner of proceeding, will be immediately forwarded upon the receipt of 3 rbls. Apply to the inventor (in the German language), by letter, post paid, addressed C., to the Central Office of Advertisements of Al. Wileken, in St. Petersburg, Wassili Ostroff, 5 line."

PHOTOGRAPHY THE BEST DETECTIVE.—The Viennese *Neue Freie Presse* relates the following respecting the capture of an Englishman, named Grey, who by means of forged cheques on the Union Bank of London swindled the house of Rosenbaum of a large amount of money. Through accident the said banker, Mr. Rosenbaum, became possessed of a photograph of the fugitive, and gave the same to the police inspector, Breitenfeld, at Vienna, who remitted it to Mr. Pollaky, an Austrian resident in London, who caused the necessary inquiries to be made in London, as it was supposed Grey made direct for England with his booty. Last week it happened, however, that Mr. Pollaky, on his way to Vienna, passed through Hamburg, and there visited the theatre, and during the *entre'acte* passed his time by inspecting the audience, when, to his great surprise and no less satisfaction, he discovered in one of the visitors the most striking resemblance to the photo sent to him some months ago from Vienna. Of course this man was at once closely watched, and a telegram despatched to Vienna; upon which the firm despatched their cashier, who recognised the swindler, although a great change in his appearance had taken place since his *debut* at Vienna. A large sum of money has been recovered, and Grey has since pleaded guilty to the charge, and has been sent to Vienna to be dealt with there according to the Austrian laws. Strange to say, this man, who assumed the nationality of an Englishman, is no Englishman after all, but a Frenchman by birth, and speaks English very imperfectly. About £7,000, with drafts to the amount of 30,000f., have been found on his arrest.

MR. WARREN DE LA RUE'S PHOTOGRAPHS OF THE MOON.—Our excellent contemporary the *Engineer*, of last week, has a most admirable and complete account of Mr. Warren de la Rue's photographic operations at Cranford Observatory, with capital and extensive illustrations. We shall have something more to say on the subject in our next; but we should counsel all our readers having any interest in this branch of our art to get last week's *Engineer* for preservation.

To Correspondents.

F. B.—Hitherto no licence has been required by amateurs for working with Swan's carbon process, and, so far as we know, none will be required in future; but as the patent is passing into fresh hands, and its commercial application will receive energetic attention, we cannot with certainty detail the future arrangements. We believe that a common screw-press may be made available for effecting the transfer.

AMATEUR.—A weak solution of sulphide of potassium may be employed to intensify a negative after it has been suffered to dry; care must be taken, however, to moisten the film thoroughly first, otherwise there will be danger of uneven action of the intensifier. For the purpose you require, we should be disposed to try pyrogallie acid with a very slight trace of nitrate solution added.

HENRY WILLIAMS.—The flatness and want of modelling and texture in the card sent, and which constitute the chief difference between it and the productions of your Regent Street namesake, are mainly due to over-development or over-intensification. You have also a little too much top-light. The print sent would have been much better for deeper printing; but when a negative has had detail and texture buried in an excess of deposit, it is difficult, by any mode of printing, to secure the delicate soft texture of flesh in the print.

C. A. M. W.—It is difficult for us to form an opinion without seeing the negative, as to whether it will yield more brilliant prints than that you enclose; but we should think it very probable that it will. Pictorially, the negative is capital; the grouping and light and shade are very good; but the print certainly lacks vigour. Try a sample of Rive paper, use a 50-grain bath, print somewhat deeply, and tone with the lime bath. It is very probable that this mode of working will give you a print with more vigour and contrast. 2. A varnish made by dissolving shellac in wood naphtha or in methylated spirit will answer well for varnishing the perforated oak false bottom to your washing machine, and it will be all the

better for such treatment. It is difficult to estimate the length of time that will be required to wash prints thoroughly in such a machine. We should think that if the machine is suffered to fill and empty itself ten or twelve times, the prints would be well washed, especially if they receive a thorough washing for a quarter of an hour with rapid changes of water before placing in the machine; but we should prefer using some of the most delicate known tests for the presence of hypo to little of the water draining from a print supposed to be well washed. 3. The continuous dribbling of the syphon is probably due to insufficient pressure of water in the supply-pipes. Let the water enter with greater force, and also flatten the bend of the syphon. 4. The silver bath with sugar, recommended by Mr. Bovey, answers admirably for amateur purposes. The sulphocyanide bath gives excellent results of a special kind. You will best ascertain if they please you by trying. 5. The yellow varnish for dark-room windows was described in the *News* for 1864 and the *Year-Book* for 1865. It consists of equal parts of raw sienna and orange chrome No. 3, as sold in tubes by colourmen, diluted to a consistency for use with japanners' gold size and turpentine, with a little "patent driers" added.

ARTHUR STRIDE.—The yellowness and spots in the prints forwarded are probably due to imperfect fixation, although such a result might, in some cases, arise from leaving the print saturated with hypo. It is probable, however, that the prints were immersed in an old and exhausted hypo bath, and are imperfectly fixed. The prints enclosed in your letter seem to be perfectly fixed. 2. The lens in an English portrait combination are generally so fixed that you cannot very well place them wrong. In French lenses, which are not burnished into the cells, it is, however, possible to arrange them improperly. The front part of the combination is placed with the convex side outwards; in the back combination the bi-convex is placed in the cell first, the ring is placed in next, and then the meniscus, concave side towards the bi-convex lens. 3. We cannot recommend any very simple work on photographic chemistry. You will best find what you require by reading the various articles in our pages.

W. J. A. G.—For landscape work, such as the Scottish Highlands, decidedly No. 3; for architecture, No. 2. A plate of about $6\frac{1}{2}$ by $4\frac{1}{2}$ or 7 by 5 we should recommend.

J. C. S.—A monohydrated acid is the strongest form of the acid, and contains only one atom of water. Pure nitric acid, for instance, is a solid crystalline body; but the most concentrated available acid is the monohydrated, which has a specific gravity of about 1.500.

AN ASPIRING ONE.—The chief photographic fault in No. 1 is that the negative has been slightly under-exposed, and the print a little over-printed. In No. 2 the negative has been slightly over-intensified, which makes the face a little chalky. The light is too directly in front of the sitter to give relief; to secure the best effect of relief and modelling, you require a high side-light as the dominant light, with a little diffused light or reflected light to prevent hardness and blackness in the shadows. Your carpet is too decided in pattern, and gives a somewhat spotty effect. We shall have pleasure in helping you at any time.

S. ARTIDGE.—You have succeeded very well considering the difficulty of the task; but perfect success in such an undertaking, with such limited facilities, could scarcely have been expected.

Wm. BARTHOLOMEW.—We fear that much of the chaos to which you refer will remain after the most careful explanation. We do not know whether the magnesia toning bath is commonly used or not, but shall print your brief remarks thereon. Thanks.

MR. W. H. WARNER, of Ross, has favoured us with an example of a tinted mounting-board in which the anti-chlor is said to be quite neutralized. We shall test it carefully, and again refer to the subject.

IGNORAMUS.—We do not recommend making any portion of the northern roof opaque; but it might be well for summer use, at least, to make such portion of it as may permit the entrance of direct sunlight semi-opaque, by stippling with white paint or covering with tissue paper. The proposed projecting board would keep out direct sunlight in sunny weather, but would obstruct much light in dull weather. For the roof light, a series of blinds; for the side-light, curtains. 2. For intensifying before fixing, when necessary, iron and citric acid, with a little nitrate solution, is most convenient, and gives excellent results. Thanks in advance for the projected account of operations.

ERRATUM.—Through an inadvertence, the diagram in Winstanley's article on Artificial Light in our last was placed upside down.

DINSDALE AND CO., and several Correspondents, in our next.

All Communications for the Editor to be addressed to 15, Gough Square, Fleet Street, London, E.C.

* All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Bromides in a Collodion Containing a Potassium Salt	265
Pictorial Effects in Portraiture	264
Echoes of the Month. By an Old Photographer	266
Sketches of Travel from a Sun-painter's Portfolio	267
"Lux Graphicus" on the Wing	269
A New Mode of Drying Plates. By M. Carey Lea	269
Pictorial Effect in Photography. By H. P. Robinson.....	270
On a New and Simple Method of Recovering Metallic Gold and Silver from Residues. By Victor G. Bloede, Chemist	272

	PAGE
Solar Printing on Canvas	272
Mr. Warren de la Rue's Photographs of the Moon	273
Proceedings of Societies—American Institute—Philadelphia Photographic Society	274
Correspondence—The Action of Hypochlorous Acid in the Nit- rate Bath—Removing the Collodion Film used in Trans- ferring Enamels.....	275
Talk in the Studio	275
To Correspondents.....	276

BROMIDES IN A COLLODION CONTAINING A POTASSIUM SALT.

ALL who have experimented in the manufacture of collodion are familiar with the difficulty of introducing any moderately large proportion of bromide into collodion in the presence of iodide of potassium. Bromide of potassium is so well known to be comparatively insoluble that, as a rule, no attempt is made to use it in collodion. Bromide of cadmium, being very soluble, is most frequently used; but a difficulty has generally been experienced, especially if the solvents employed were highly rectified, in using at the same time an iodide with a potassium base. A double decomposition has been found to take place, in which bromide of potassium has been formed and precipitated in the collodion.

Nevertheless, the use of a portion of iodide of potassium in conjunction with iodide and bromide of cadmium is often desirable. The potassium salt possesses advantages over other alkaline bases which make it a favourite with many photographers. Its presence in a collodion frequently secures intensity, brilliancy, and freedom from fog in degree greater than many of the iodides. The product of its decomposition in the silver bath—nitrate of potash—assists, by its deliquescent character, in the retention of moisture on the plate during long exposures, and checks the tendency to matt silver stains. The difficulty of using it with a full proportion of bromide has therefore often been a subject of regret with photographers.

Mr. Russell Manners Gordon informs us that as the result of some carefully conducted experiments he is able to introduce as much as two grains per ounce of bromide of cadmium into a collodion containing iodide of potassium without causing a precipitate. The proportion which can be added in the usual mode of mixing rarely exceeds half a grain per ounce. To secure the power we have just indicated a certain order of mixing must be carefully observed, the potassium salt being dissolved in water and the bromides in alcohol of 805 sp. gr. It will readily be seen that in adopting a method of this kind rigid accuracy is required to secure the exact condition in which, without adding too much water to the collodion, a sufficiently aqueous condition is maintained to keep the salts in solution. If the alcohol employed in collodion be much weaker than 820° the collodion will risk showing signs of reticulation; but if alcohol of this strength be employed in a direct manner for dissolving the salts, the bromide of potassium formed will generally be precipitated.

The first consideration, then, is to ascertain that the minimum quantity of water in which the potassium can be dissolved, and which, when mixed with the alcohol containing

cadmium salts, will keep the whole in solution, does not reduce the alcohol below the proper standard for making collodion without reticulation. Mr. Gordon has carefully worked out the conditions necessary. Commencing with alcohol commonly called absolute, but containing really a little over three per cent. of water, it will be found that the addition of water changes the specific gravity in the following ratio:—

To 1 ounce of alcohol	...	...	805 sp. gr.
5 minims of water added give	...	...	810 "
10 " " " " " "	...	...	817 "
20 " " " " " "	...	...	822 "

With these facts before him, which have been carefully verified by the aid of the specific gravity bottle, Mr. Gordon proceeds as follows:—

First prepare the normal collodion after the following formula:—

Ether, 725°	...	...	4 drachms
Alcohol, 805°	...	...	2 "
Soluble cotton	...	...	6 grains

Then proceed to prepare the iodizer, as follows:—

No. 1.

Iodide of cadmium	...	...	8 grains
Alcohol, 805°	...	...	6 drachms

No. 2.

Iodide of potassium	...	...	8 grains
Water	...	...	20 minims

Dissolve, and add to No. 1.

No. 3.

Bromide of cadmium	...	...	8 grains
Alcohol, 805°	...	...	2 drachms

Dissolve and add to the above, then filter and keep for use. Then add one part of this mixture to three parts of the normal collodion.

Each ounce of the prepared collodion will then contain—

Ether	...	...	...	1/2 ounce
Alcohol, 805°	...	...	...	2 drachms
Alcohol, 822°	...	...	...	2 "
Soluble cotton	...	...	...	6 grains
Iodide of cadmium	...	...	...	2 "
Iodide of potassium	...	...	...	2 "
Bromide of cadmium	...	...	...	2 "

"This," Mr. Gordon adds, "I find as good a collodion for the wet process as any I ever used."

"I do not like it for dry plates, as I prefer 3 grains of bromide for this purpose, and the potassium salt will not admit of so large a quantity."

PICTORIAL EFFECTS IN PORTRAITURE.

WE have recently received from Messrs. Robinson and Cherrill* some very admirable examples of cabinet portraiture, in which it is attempted to secure something beyond mere portraiture, each subject being treated as a picture possessing charms independent of the question of likeness. In relation to picture-making, the superiority in size of the cabinet to the card portrait becomes an important element of success or failure. It is an advantage and an element of success if the photographer be master of the art department of his work; it is an element of failure if he lack the power of composition or securing pictorial effect; and this is probably one reason for the tardy adoption of cabinet portraiture: it undoubtedly taxes the artistic capacity of the portraitist to a greater degree than does the card portrait.

The idea embodied in the charming portraits introduced by Mr. Edge has doubtless suggested the mode of treatment adopted in these pictures; but as the size is larger, a more ambitious treatment becomes necessary. In Mr. Edge's cards the picture consists chiefly of foreground and distance, without appreciable middle distance, and the limited dimensions of the picture seem sufficiently filled, and scarcely suggest a want. In the larger cabinet size this treatment is not permissible: every plane must be properly made out, or the picture is imperfect. The subjects consist, for the most part, of pretty children, some in rustic costume, playing amid trailing wild flowers, grass, and ferns; in some cases a fine landscape from a second negative furnishes the background; in other cases a skilfully painted scenic background is employed, which is so contrived as to admirably blend the natural effects in the foreground with the painted effects on the screen. In some other of the specimens a winning little child is dressed in somewhat quaint-looking, old-fashioned costume, forcibly reminding us of some of the favourite pictures of Sir Joshua Reynolds, whose style is somewhat followed in the treatment of the pictures, which have dark backgrounds, with a few dimly made out accessories, employed for the effect of light and shadow, rather than the sharp rendering of their forms as objects of importance. In all cases the pictorial effect is admirable, and many of the pictures altogether charming.

We have also before us some very admirable examples of cabinet portraiture by Mr. Inglis, of Montreal, especially distinguished by their pictorial treatment and for the skill with which a natural foreground is supplemented by a scenic background. In some of these the effects of snow and ice, which we have before described in connection with Mr. Notman's pictures, are admirably rendered, and produce a good effect of harmony with the Canadian winter costumes of the models. In others a good effect is produced by a rocky foreground with well painted sea and sky for distance. In others, again, we have children playing in a garden scene, with capital natural accessories, and well-painted landscape beyond. Fine judgment is required in this blending of the natural with the artificial, in order to secure keeping and harmony, and Mr. Inglis has in all cases succeeded admirably. The portraiture and the technical photography are throughout of high excellence.

A series of card portraits of children with which Mr. Inglis has favoured us are amongst the most marvellous things we have seen in child portraiture. The models chiefly consist of two little ones, of apparently about two years old and four years old respectively. They furnish about a couple of dozen different subjects, in which almost every phase of expression possible to childhood is embodied. There are various phases of mirth and laughter, various forms of grief and crying; surprise, defiance, mischief, study, pensive contemplation; action of various kinds, and repose in various forms, all very capitally rendered, and telling their own tale. Mr. Inglis appears to have succeeded in acquiring the true art of taking young children—working rapidly, keeping the sitters interested, and avoiding coercion or fatigue.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

ENGLISH LENSES—MR. McLACHLAN'S COMMUNICATION—MR. WOODBURY'S PROCESS—THE CARBON PROCESS—M. SALOMON'S UNMOUNTED PRINTS—DRYING NEGATIVES BY HEAT—TRANSFORMATION OF SILVER INTO OTHER METALS—SOCIETIES.

I WAS strikingly reminded of the wholesome old proverb, *Ne sutor ultra crepidam*, by a recent article in your generally excellent contemporary the *Mechanics' Magazine*, in which the writer is excited to virtuous indignation by a contemplation of the high prices charged by English opticians for photographic lenses, whilst, according to this writer, equally good lenses can be purchased in Paris for half the money. It seems, too, that photographic journals have sadly neglected their duty in not informing photographers of these facts, and calling their attention to the superior cheapness of the continental productions. There is something very amusing in the profound ignorance of the writer, who fancies he is communicating a new thing to photographers in stating that French lenses are cheap, or rather low-priced. Perhaps there is scarcely a studio in the kingdom in which there is not, or has not been at some time, a cheap French lens, which in some exceptional cases may be a good one, but which, in the majority of cases, is so far otherwise, that when the photographer can possibly afford it he will pay three times the price of the French lens for a first-class English instrument. If the writer had been informed upon his subject he would have known that not only are photographers generally tolerably familiar with the qualities of French lenses, but that French and other continental photographers know something of English lenses, and, notwithstanding their greater price, use them. If he had visited the studios of Bingham, Reutlinger, Ferrier, Disderi, Angerer, and many others whose works are known throughout the world, he would have seen that they employed English lenses; and he ought further to have known that his statement that at the late International Exhibition a "foreigner carried off the first prize for photographic lenses, leaving the best English opticians out in the cold," was simply not true. There were only four silver medals awarded to opticians, and these were for English, French, Prussian, and Austrian lenses; and, further, the two principal English opticians each received gold medals. The scientific blunders in the article, I presume, you will deal with in good time.*

The conviction I stated in my last *Echoes*, that Mr. McLachlan underrated the intelligence and capability of photographers generally, was, I think, more than justified by that gentleman in his recent communications to the Photographic Society, and I was glad to hear Mr. Fry, with considerable point and force, endorse my remarks. It required all one's respect for Mr. McLachlan's honesty and earnestness, and gratitude for his evident good intention, to keep anything like patience with the strange farrago of unscientific terminology. I felt strongly inclined to quote Sir Walter Scott's *Antiquary*, where he exclaims to Sir Arthur Wardour: "Take a glass of wine, and wash down that bead-roll of unbaptized jargon that would choke a dog." If I understand the practical advice given to photographers, it is to this effect: "You have already sunned your baths a little; you will find it advantageous to sun them much more. You have been in the habit of using nitric acid; henceforth avoid it. You have preferred ripe reddish collodion; in future use a colourless neutral sample. You have hitherto found that an iron developer worked cleanest when a portion of it had become oxydized; I recommend you to produce the same result in what I conceive to be a better manner." *Voilà tout!* Much of the advice is doubtless good, but I cannot see why it should have been heralded as a great secret.

* The charming pictures by Messrs. Robinson and Cherrill are published by Marion and Co.

* The article in question was so curiously full of obvious error that it is not likely to mislead many. The pressure on our space of more interesting matter leaves us no room for dealing with an unimportant matter.—Ed.

Few inventions have been the victim of so many commercial misfortunes as Mr. Woodbury's photo-relief printing process, all of which tend to retard its fair chance of commercial application. After more preliminary troubles than most novelties encountered, a company was formed for working it in Manchester; but, beyond causing considerable delay, nothing was effected. The commercial utilization of the process did not seem to be advanced at all. Next, we hear that the patent has been purchased by a company in London, Disderi and Co., Limited, and active preparations are made for the working of the process. Fine examples of the work begins to be seen in retail establishments, and a full tide of prosperity seems to be promised, when suddenly Mr. Disderi is reported as "wanting," and shortly his solicitor applies to the Court of Chancery for a liquidator, and states that no money at all has been contributed by the shareholders and directors. *On dit*, that not less than £40,000 has been supplied by a French capitalist to the company in London to initiate and carry on its business, but that no satisfactory answer can be given as to where the money has gone. To those having a purely scientific interest in the progress of this mode of printing, these things are somewhat distressing, because they delay the establishment of a good process, which, in spite of the commercial difficulties, has steadily progressed in the excellence and certainty of its results.

The commercial application of the carbon printing process has not been so rapid as might have been desired; but it has had no such drawbacks as those I have just mentioned, and in the hands of the new company, which will, I understand, direct its fortunes for the future, will, I believe, be worked with great energy. Perhaps its success in the hands of Mr. Braun, of Dornach, is unparalleled in the history of our art. It seems only the other day since it was initiated by Mr. Swan, in Dornach, and now they are turning out fifteen hundred prints daily by the process; and the spirited proprietor, who has invested over £16,000 in the work, is, I hope and believe, making a rapid fortune by it. The purpose of the Autotype Company, to inaugurate a new system of reproduction by the aid of this process, promises well for art education in a form hitherto sadly neglected.

The unmounted Saloman prints will, I presume, remove the remaining doubts of sceptics. For my own part, although fully satisfied that the photography was of rare excellence, I must confess that a sight of a score of such examples of magnificent photography in the rough state has surprised me, and I am almost disposed to concur with the dictum of an artistic friend, that any touching upon such prints was almost desecration. I may here repeat one curious remark I have heard, to the effect that if any "dodge" had been practised, it consisted in giving a few touches, to suggest that a far greater amount of artistic skill had been applied in finishing than the prints had either received or required.

Have any of your readers ever noticed a fact recently mentioned by an American correspondent in your pages, namely, that a negative dried by the fire was generally more brilliant than one left to dry spontaneously. I have never seen it mentioned before, but I remember to have been occasionally struck by the fact in my own practice. It is surely something worth further examination.

One of the most interesting papers I have read for a long time is that recently contributed by Herr Grune to your pages, on the transformation of the image obtained in silver to some other metal by a process of substitution. It appears to me to point out a comparatively unworked field for photographic experiment. With the exception of the well-known method of converting the image in a salt of mercury, but little has been done in that direction. Research in this direction furnishes a new field, I fancy, for experimentalists in photographic engraving.

The meetings of societies during the month have in many cases been interesting. The length of Mr. McLachlan's

communication at the Parent Society left little time for discussion; but the remarks made were interesting, and to that purpose. Mr. Spiller's comments on the statements put forth furnished an admirable example of quiet force strikingly in contrast with Mr. McLachlan's excited exuberance. The example of Mr. Robinson's promised presentation print, a charming composition, entitled "Watching the Lark," excited much interest. At the North London, Mr. Boekett's paper on the condition acquired by chemicals after long disuse, was interesting, and might in a fuller meeting have excited more copious discussion. At the South the material was more meagre than usual, or the members were less disposed for discussion. Some capital enamels were exhibited by Mr. Henderson, and some fine studies by Mr. Rejlander, as well as a large number of M. Salomon's unmounted prints, which excited equal surprise and gratification by the photographic perfectness of the pictures.

At the Oldham Society, which maintains its activity, Mr. Beverley read a good paper on "Dry Plate Photography," in which he expressed his preference for Mr. England's process. At the Edinburgh Society Mr. Muir gave some photographic experiences in Sweden. A discussion followed on the fading away of the image on dry plates when kept long before development. At the Liverpool Society an interesting discussion took place on the collodio-bromide plates of the Liverpool Dry Plate Company, some fine negatives, obtained by development with a weak solution of ammonia, being shown in illustration of the value of this mode of operating.

SKETCHES OF TRAVEL FROM A SUN-PAINTER'S PORTFOLIO.

BY STEPHEN THOMPSON.

"What we write
Should be the reflex of the thing we know.
How can he limn the glories of the morn
Whose eyes have never looked upon Aurora's face?"

Prof. Aytoun.

No. 1.—A WEEK ON THE ISLAND OF IONA.

THERE is a little island lying off the bleak and stormy coast of Argyshire to which, in bygone days, a peculiar odour of sanctity was attached, and a belief in special privileges to be conferred at the end of the world on those buried thereon. There together sleep the mighty of a long past age—a long line of Scotch, Irish, and Norwegian kings; a race of "Lords of the Isles," and powerful chieftains from far and near. After many a stormy and turbulent life, Norseman and Scot alike came there to repose in quiet proximity. On dark winter nights, when the storm-driven waves of the Atlantic lash the wild rocks on the seaward side of the island, and the blue hills of Morven to the north, wreathed in mysterious mist, are full of all that which inspired the song of Ossian, the ear of fancy may hear borne on the wings of the wind the wail of sorrow for "the dark-haired Orla, destroyer of Lernes, chief of Oithona," or the bards raise the song of praise for the yellow-haired son of blue-eyed Mora,—

"Whose dark ghost gleams on the red stream of tempests?—Lovely was thou, but not harmless was thy sword! It hangs in thy cave: the ghosts of Lochlin shriek around its steel. Hear thy praises! Thy name shakes on the echoes of Morven! Then raise thy fair locks, spread them on the arch of the rainbow, and smile through the tears of the storm."

A low rocky isle set in the Northern Sea, is the island of Iona, one

"Where more of winters than of summers be,"

but though destitute of tree or shrub, there are patches of verdure here and there, upon which the black Highland sheep graze and are content. The cottages in which the islanders dwell are of the rudest description:—roofs of thatch, secured with lacing of hempen rope where the Swiss chalet would have had rude planks of dark brown timber secured with large stones at regular intervals. Under one of these roofs I was fortunate in possessing half a bed-room shared with an engineer engaged in superintending the construction of another lighthouse near the far-famed Skerryvore, built by

Stephenson. Many rough days and tough yarns had we at night over difficulties experienced in effecting a landing, he on his rock, and I on mine at Staffa!

But there is no place sacred from the ubiquitous camera, and Wilson's admirable views have made the island familiar to many of those who will never tread its shores. The remains of the world-famed cathedral and monastic establishment are situate on the more sheltered side of the isle, looking towards the Ross of Mull. This earliest of Christian temples, this link of links between past and present, is invested with associations of undying interest. The story of St. Columba is a peculiarly fascinating one, and reads like an epic: his noble self-denial, his lofty piety and indomitable courage, his formidable contests with Druid priests and a barbarous people, until Christianity spread over all Scotland; how he lived and laboured on, and how, when life's long day was spent, laid himself down in his cell by the sounding sea, and at evening time there was light!

It presents no peculiar difficulties to the photographer, save those of forethought in connection with the safe transit of fragile apparatus and chemicals over seven or eight hundred miles of land and sea, and the landing and re-shipping the same in small open boats at sea on an iron-bound coast. The finely-balanced nervous temperament of the Duke of Wellington, we are told, consisted in a due mixture of the apprehensive and the resolute—a constant apprehension and expectation of contingencies, and a perpetual preparation against them. When once questioned on the subject, he stated that he never thought of what he should do if victory were his, but a great deal about what he should do in case of defeat. Similar qualities should be those of a landscape photographer. The journey occupies three or four days from London; from Glasgow two days. Leaving the Bromielaw at 7 a.m., by Messrs. Hutchison's magnificent steamship *Iona*, built on the American principle, you reach Oban the same night by way of Ardrishaig and the Crinan Canal. In the season, another boat leaves Oban twice or three times a week for Iona and Staffa. As the wind and weather in these Western islands is often of such a nature as to ensure a long detention, it is as well to prepare beforehand. Those mindful of their creature comforts may be reminded that there are such people as Crosse and Blackwell, and such things as potted meats and other et ceteras. Good eggs and butter may generally be obtained, but anything further must not be reckoned upon. Even fish, except a species of weak, watery flounder, is not to be had. Their boats are not seaworthy enough for good fishing. Spirits of any kind is interdicted upon the island by the Duke of Argyle, to whom it belongs. No whisky toddy (!) unless you have a flask of your own. I, who write, have often subsisted for days and weeks upon little more than oatmeal cake and butter, in remote parts of the Highlands; but there are times when one is overtaken by an inexpressible longing for the flesh-pots of Egypt.

There is one great comfort in photographing cathedrals: being always built from east to west, and generally cruciform, you know beforehand at what time your subjects will be duly lighted for your purpose. The east end must be looked after pretty early; the south porch during the day; the north porch at almost any time, as the sun will never be on it; and your *chef-d'œuvre*, the west front, later in the day; or, best of all, if the porches are not very deep, just as the sun is stealing round and casting flickering shadows athwart its best points. If the foundations of the hills were laid from east to west, and the rivers all flowed in one direction, what a deal of prospecting it would save us. Now an artist (!) has to spend a day in prospecting, or run the hazard of perhaps hiring an expensive hack-carriage, to find himself, on arriving, just an hour too late. As there is one hour when a subject is at its best, the odds are exactly eleven to one against him. Indeed, even as the first Napoleon said battles were lost or won by a critical quarter of an hour, so even of the hour at which a subject is due, there is one quarter of

an hour at which it is emphatically best. If any one doubts this, let him take two or three negatives fifteen minutes apart, and he will not have any difficulty in afterwards indicating the best one. The wind is always troublesome here; but, from the bare and sterile character of the place, there is no difficulty with the foliage, because there is none; and a big stone, as heavy as possible, laid on the camera will always keep it rigid. There are but two good views to be had of the Cathedral—one from the S.E. and one from the S.W., beside some details. A view of "Dun-Y"—mentioned in Scott's "Lord of the Isles"—may be taken; but *le jeu ne vaut pas le chandelle*.

Here, on the skirts of civilization, papers and letters reach you at long intervals. It seems a place "half without and half within" the busy world. The "Post Office" is a rude hut, with mud for the floor, and the arrival of Her Majesty's mail *viâ* "Mull's dark sound," per marrowbone-stage, is duly celebrated on those nights by a tallow candle stuck in the neck of a bottle, a great sorting of half-a-dozen letters, and much excitement.

If you get some rainy days, it is well if you have books with you, for there is little else to kill the time. It is always better to carry one or two standard books of a calibre that will bear reading again and again. Lighter books, once read, are "sucked oranges," and perhaps, notwithstanding, being too expensive to toss aside, become an annoying encumbrance all the remainder of your journey. If you are familiar with that inimitable biography, "Boswell's Life of Johnson," you may go and stand where the worthy Doctor stood with his attendant's shadow Boswell, while "doing the Hebrides," and once again hear him utter, in ponderous sentences, full of the true Johnsonian ring, with outstretched hand, and cane firmly planted the while, that remarkable passage containing one word for Iona and two for the mental superiority of himself and his friends: "We are now treading that illustrious island which was once the luminary of the Caledonian regions, whence savage clans and roving barbarians derived the benefits of knowledge and the blessings of religion. To abstract the mind from all local emotion would be impossible, and would be foolish if it were possible. Whatever withdraws us from the power of our senses, whatever makes the past, the distant, or the future predominate over the present, advances us in the dignity of thinking beings. Far from me and from my friends be such frigid philosophy as may conduct us, indifferent and unmoved, over any ground that has been dignified by wisdom, bravery, or virtue. That man has little to be envied whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona."

But few of the beautiful crosses which marked where slept mighty sea-king or bold chieftain are left. Upwards of 300 of them were thrown into the sea by order of a stupid *Synod* of Argyle in the sixteenth century. There are, however, three still standing: Maclean's Cross, by the pathway, and two within the Cathedral precincts. Others now sleep within the lonely walls which encircle this and St. Oran's Chapel; and graves of more recent interest may there be found side by side.

One dark December day—the last of the old year—disabled, dismayed, unmanageable, scarce knowing where she was (for the Skerryvore light had been sighted by her fine Scot-American captain too late to save, had the ship been still under control), the *Guy Mannering*, a big New Yorker, cotton laden, came headlong on the pitiless rocks facing the wild Atlantic. On the cliff top the islanders gathered in a group, having hurriedly left the afternoon service at the little kirk by the shore (it was Sabbath day) on learning there was a big ship "coming in." Little aid could they render, but gazed in powerless horror, while some of them endeavoured to indicate the best place—if there could be any best—to be dashed upon, or where, at least, most lives could be saved. Alas! all control was gone, and bold hearts and skilful seamanship could avail nothing. Gathered

in another group, on the fore-castle of the doomed ship, stood officers, crew, and passengers, awaiting in silent terror their inevitable fate. A brief interval, and on she came. One crash—a rebound—another, and the *Guy Mannering* was rent into a thousand pieces. Where a huge ship appeared a moment before, the seething waves were dotted with planks, broken spars, bales of cotton, and drowning seamen. Darkness soon veils the rest, and when morn glimmers on the shore the sleepers are many. The breeze of ocean lifts their locks, but they do not awake. The people gather them together under a sail on the hillside. After a few days, in the feeble sunlight of an early January afternoon, with bare head and measured step, these islesmen bore them in long procession across the island to the lonely Cathedral ruins, where the last rite man paid to man was paid. So they buried them, these simple Islanders, and the dust of these nineteenth century seamen—Yankee, Irish-American, and negro—mingles with that of kings and chiefs who lived before the Norman Conqueror, 800 years ago.

“LUX GRAPHICUS” ON THE WING.

THE LATE LORD BROUGHAM—NEW FIELDS FOR PHOTOGRAPHY—NATURAL OBJECTS COLOURED—THE MONOCHROME AND AUTOTYPE—MR. MCLACHLAN AGAIN.

DEATH has just swept away one of the most gigantic intellects of the nineteenth century. For me to state what the late Lord Brougham was, or attempt to enumerate his vast attainments, or measure the strength of his colossal mind, would be a piece of intolerable presumption; but I think I may safely say that he was an enthusiastic admirer of photography. Years ago, in the midst of his parliamentary and other pressing duties, whenever he could find time to enjoy the quiet of Brougham Hall, near Penrith, his giant mind was not above indulging in the delightful relaxation it afforded; and many a pleasant hour he used to spend chatting with Mr. Jacob Thompson, an artist of great ability, and also a very early amateur photographer, on the wonderful results obtained by the new art. The late Lord Brougham began his literary career by publishing a treatise on Light, before photography was known or thought to be practicable; in after life he interested himself in its marvellous productions; and his last literary labour was also about light. Not only did the great statesman “know a little of everything,” he did a little in everything. The deceased lord took a lively interest in the progress of photography during his lifetime, from its earliest introduction to within a short period of his death; and it would have been a graceful and fitting compliment to the memory of the great man of law, politics, literature, and science, if the English newspapers had embellished their memoirs of the late Lord Brougham with a photographic portrait of his lordship. Such a thing is quite practicable, and has been done successfully by our more enterprising confrères in Canada and the United States. The *Montreal Weekly Herald* of April the 18th illustrates its memoir of the late Mr. T. d’Arcy McGeoe with a very excellent carte-de-visite portrait of the lamented and unfortunate Canadian Minister, mounted on the upper corner of the front page, surrounded with a deep black border. What an appropriate accompaniment such a presentation would have been to the able articles and memoirs which appeared in the daily press on Monday, May 11th, 1868! How much more interesting and valuable those clever biographical sketches of great men, as they pass away to their rest, which appear in the *Daily Telegraph* and other daily and weekly papers, would appear if illustrated with a photograph from life! That it can be done the *Montreal Weekly Herald* has recently and satisfactorily shown; and surely there is enterprise, spirit, and wealth enough among the British newspaper proprietors to follow the very laudable example of our transatlantic cousins. Negatives of great men are always attainable, and there need be no commercial difficulty between the photographer and newspaper proprietor on the score of supply. A multiplication of negatives or Woodbury’s process, would afford all the necessary facilities for producing the prints in large numbers.

Many new fields for the good of photography are opening up. Pathological works have been photographically illustrated with some amount of success. But far pleasanter fields are open to enterprising photographers in the faithful representa-

tion of natural objects, such as flowers, fruits, ferns, grasses, shrubs, trees, shells, seaweeds, birds, butterflies, moths, and every variety of animal life, from the lowest orders to the highest. I believe the time is not far distant when the best works on all the physical sciences will be illustrated by coloured photographs. Those very beautiful German photographs of flowers recently introduced show most conclusively of what photography is capable as a help to a study of the natural sciences. The flowers are not only photographed from nature, but exquisitely coloured after the same fountain of truth; and the sense of reality, roundness, and relief which they convey is truly wonderful. Hitherto the colouring of natural objects photographed from nature has been a very difficult thing to accomplish; but now it is done, and with a marvellous success.

The monochromatic process is also making great strides in advance. Those very beautiful transparencies, cabinet size, of the Queen and Royal Family are now to be seen in most of the photographic picture shop-windows in town and country. Those transparencies are the productions of the Disderi Company, by Woodbury’s photo-relief process, and the results now obtained are really beautiful, both in effect and colour, and sold at a very low price. But the *chef-d’œuvre* of all monochromatic effects has just been achieved by the triple labours of Mr. Macnee, the artist, and Mr. Annan, the photographer, of Glasgow, and Mr. J. W. Swan, of Newcastle. The subject in question is a work of art in every respect. The original is a full-length portrait of Lord Belhaven, painted by Daniel Macnee, and now in the Royal Academy Exhibition. A photograph taken from the painting by Mr. Annan was worked up in monochrome by the eminent artist, from which another negative was taken by the same skilful photographer, and placed in the hands of Mr. J. W. Swan, to be printed in carbon, which the latter gentleman has done in the most admirable manner. Altogether, the result is the most satisfactory reproduction by photography that has ever been placed before the public, and is less like a photograph and more like a fine mezzotint engraving than anything I ever saw. Mr. Annan is now publishing the work on his own responsibility, and a specimen of it can be seen at the offices of “The Autotype Printing and Publishing Company,” 5, Haymarket, London. Mr. Hill, of Edinburgh, is also about to publish, in carbon, a photograph of that beautifully painted picture entitled “A Fairy Raid,” which was exhibited last year in the rooms of the Royal Academy by Sir Noel Paton. As in the former case, Mr. Annan copied the painting, Sir Noel worked on a print in monochrome, which was again photographed by Mr. Annan, and the negative passed to Mr. J. W. Swan to be printed in carbon. I understand that Prynter’s celebrated picture of “Israel in Egypt” is about to be published, in a similar manner, by the Autotype Company. It is therefore quite evident that photography is becoming, in reality, more and more “a foe to graphic art,” and eclipsing the lights and deepening the shadows of the *unlucky* engraver.

Mr. McLachlan has again spoken without giving any very materially new facts, or throwing much more light on his mysterious mode of working. The great point is, to throw light on the concentrated solution of nitrate of silver; and until that has been done it will be impossible for any one to say from experience and practice that there is nothing in the principle. Mr. McLachlan attributes a chemical property to the action of light on the bath that has never been thought of before, and he seems to believe it so sincerely himself, and expresses his convictions so earnestly, that I think photographers are somewhat bound to wait patiently till time and light will enable them to comply with all the conditions he lays down, and make a series of careful experiments, before they can say whether they are under obligations to him or not. At any rate, natural justice suggests that they should not render a foregone verdict.—Yours very truly,

May 17, 1868.

LUX GRAPHICUS.

A NEW MODE OF DRYING PLATES.

BY M. CAREY LEA.*

I SHALL endeavour, in what I am about to say, to show the vital importance of perfect drying for dry plates, the imperfection of the methods commonly employed, and then shall describe a new method exclusively employed by me for nearly a year with most satisfactory results.

* Philadelphia Photographer.

First, then, I believe that the importance of perfect drying is as yet being only begun to be understood by some of the most experienced dry-plate workers. To this source I am disposed to ascribe the uncertainty commonly attributed to dry-plate work, which uncertainty quite disappears when a perfect method of drying is used. I can say that having dried hundreds of plates by my own method I have never seen one turn out insensitve.

M. de Constant, an experienced dry-plate worker, writes me that he has succeeded in tracing up cases of at first most puzzling non-success to a deposition of dew upon plates transferred from a colder to a warmer and damper atmosphere. This is the same thing in another form. A dry plate must be dry. And when a photographer takes with him a dozen imperfectly dried plates, and finds spots, stains, and irregular development, he should have known that he was preparing for himself nothing but disappointment. Dry plate work, properly conducted, is singularly free from stains of all sorts.

Again, the ordinary methods of drying lead directly to imperfect results, unless, perhaps, where the operator places his plates in an oven, and so applies a steady, dry heat. Few persons, however, have conveniences of that sort, and most photographers will very decidedly prefer to dry their plates in the dark room. This leads directly to placing the plates in a dark closet to dry, a method of the most imperfect character, and liable to several grave objections. First, the whole air of the closet becomes damp by the evaporation, which is consequently checked. The last portions of dampness are those most difficult to expel, and it is just when the plates have reached that stage that the atmosphere becomes most incapable of finishing its work; in fact, the tendency in such a case is to establish a sort of equilibrium of moisture, the plates reaching the same stage of half dryness as the air, and then ceasing further to dry. It is not surface dryness that is wanted, but through and through dessication. Another defect of closet drying is, that the plates are rested on blotting-paper, which keeps up moisture at one end and tends to irregular drying, which is always accompanied by irregular sensibility, leading to unsatisfactory results; and if the closet be left a little open to change the air, we then run the risk of dust settling on the moist surface.

In a close box some of these evils are avoided, but no satisfactory drying can possibly be effected unless there is present a substance that energetically absorbs moisture. So far chloride of calcium is the only substance that has been used; very few, however, have been willing to use it. It rapidly liquefies, and then must either be rejected as worthless, or else must be evaporated down to dryness, and then be fused in the fire. There is yet another objection to this method, that if a particle of dust of the chloride should get on a plate it would adhere, liquefy, and cause a ruinous stain.

I avoid these difficulties, one and all, by the use of sulphuric acid. However inappropriate this substance might at first seem, it works so well as to leave nothing to be desired. Sulphuric acid has long been used in analytical chemistry for dessicating, and it may most advantageously be introduced into photography.

The mode of employment consists simply in placing it in a pan or basin in the drying-box. The plates to be dried either have a corner set in one of a series of tumblers ranged round the sides, or else are set in a frame which is placed in the drying-box.

Now, one great advantage of this method is that its cost is absolutely nothing. Sulphuric acid is so cheap, that even if, after it had performed its office, it was rendered worthless, the cost would not be great. But there is not even this drawback. A considerable quantity of sulphuric acid is wanted in the photographic laboratory for cleaning plates, so that the method here proposed for drying works in most conveniently with the method of cleaning with bichromate of potash and sulphuric acid which I introduced some years ago. The sulphuric acid, after it has absorbed so much

moisture in the drying-box as to be no longer useful, is as good as ever for cleaning with.

As the acid augments continually in bulk, by reason of the water which it absorbs, the photographer will do well to bear this in mind in the selection of a vessel to contain it. Ordinary photographic porcelain pans are not very suitable, even the deep ones, on account of the danger of spilling when they are lifted out. Basins about three inches deep are better. Good porcelain will stand sulphuric acid indefinitely; bad will not. Glass is excellent; common glass finger-bowls will do very well; several should be placed in the box with half a pound to one pound of sulphuric acid in each. After the acid has swelled to double its original bulk it should be replaced with fresh.

Although I had used this method for a long time, and with regular and unvaried satisfaction, I did not care to publish it without making a careful comparative test. Some might imagine that plates which had been in presence of so powerful an acid might, though very well dried, exhibit less sensitiveness than plates managed in the usual manner. To be able to reply positively to any such objection, the following comparison was made:—

Two plates were prepared under circumstances absolutely identical. One was dried by the new method; the other was set in a dark closet, resting against a large bottle of very hot water; after drying, both received an equal exposure, and were developed side by side in pairs. The plate dried over sulphuric acid proved the more sensitive of the two.

It seems of interest to make the remark here, that imperfect drying always diminishes the sensitiveness. For example, the lower end of a plate is always the last to dry. If a plate be exposed before the lower end is dry, that part will be found to give a thinner image than the rest.

My own experience points to twenty-four hours as being the proper time in the drying-box. At least I find that if plates be prepared at night, and be used the next morning, there is danger of finding the lower corners insensitve from incomplete dessication. Of course, when plates are dried by heat, the time may be greatly shortened, but I have never liked this mode. When a plate is dried horizontally, spots tend to dry more slowly than the rest, and these cannot fail to show themselves in the development. If the plates be reared up, resting partly on a hot tin and partly on their own edges, these edges need blotting-paper under them, and this must tend to irregular action and cloudiness. Plates dried as here recommended, in a box with sulphuric acid, are very free from all faults that can be ascribed to irregular drying.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER XIX.

"Peculiar toil on single forms bestow,

Then let expression lend its finished glow."—*Du Fresnoy*.

"We must not omit to speak of the hand as an instrument of expression. Formal dissertations have been written on this; but were we constrained to such authorities, we might take the great painters in evidence, since by the position of the hands, in conformity with the figure, they have expressed every sentiment. Who, for example, can deny the eloquence of the hands in the Magdalen of Guido; their expression in the cartoons of Raphael; or in the Last Supper, by Leonardo da Vinci? We see there expressed all that Quintilian says the head is capable of expressing. 'For other parts of the body,' says he, 'assist the speaker; but these, I may say speak themselves. By them we ask, we promise, we invoke, we dismiss, we threaten, we intreat, we deprecate, we express fear, joy, grief, our doubts, our assent, our penitence; we show moderation, profusion; we mark number and time.'"—*Sir Charles Bell*.

PORTRAITURE—continued.

PORTRAITURE may consist in the representation of a single figure, or of a group of persons. We will first consider the composition of a portrait picture in which one person only is represented.

Long experience will show that the two sides of every face differ. This is very evident in many faces, and in all, how-

ever regular the eyes may seem, or however straight the nose may appear, close observation will discover that one side is better than the other. It is this side that should be taken. Even in a full, or nearly full, face this variation should always be noticed and taken advantage of. These deviations from exact correspondence of the sides of the face have not been considered blemishes by great painters, who invariably noticed and recorded them. It is notably so in the portraits by Reynolds. It may be seen in the print from the *Ugolino*, where it increases the look of fixed despair, and in the front face of Garrick, in which the difference of the eyes strikingly assists the archness of the expression.

In photographic portraiture the face should be turned away from the light. If the face is turned to the light, however delicate the half-tones may be, the line of the nose will be partly lost in equal light on the cheek behind it. Painters occasionally represent faces in this position as regards the light, but then they have the advantage of colour to produce relief. The only exception to this rule—that the face should be turned from the light—is in the case of a profile, or the profile showing a glimpse of the off eye when the nose comes clear against the background. For these reasons—that is, because it is necessary to choose which side of the face is to be represented, and because the face must be turned from the light—it is well to have a studio so constructed that the light can be obtained from the right or the left; in a ridge-roof studio, with one side glass and the other opaque, both ends should be available for use. It is also well to have it sufficiently wide to enable the operator to work diagonally, and thus get a modification of the shadows without the use of reflectors.

Having decided the side to be taken, which also determines the general direction of the light, the next consideration is that of attitude. As regards the position of the head, Burnett observes: "Every one who takes the trouble to reflect must perceive that all faces contain two points of view, where the character is more or less developed—a profile, and what is termed a front view; and that the seat of a strong likeness lies sometimes in one greater than in the other. They must also perceive that what is called a three-quarter view of the head gives the artist an opportunity of representing both; independent of which advantage, it has a greater variety in the forms, and gives an opportunity for introducing a greater breadth of light and shade, and also of showing the ear, which is often a beautiful feature." A full face is seldom so agreeable in photography as one slightly turned away.

In selecting and arranging an attitude, the application of the general principles I have dwelt on in previous chapters will be of more value than any recipe that could be given; in fact, as I have said before, any specific directions or plans of portraits—thus will we arrange a man, thus will we arrange a woman, or thus will we arrange a child—would interfere with individual characteristics, and do more harm than good. But a few general remarks may be useful.

A single figure should be complete in itself; it should not appear as though it had been cut out of a group, and it should be incapable of having another figure added to it without injury. The head being the chief object, every line should be composed in relation to it, and the student will find the rules of pyramidal composition invaluable to him here. He must consider contrast of lines and balance, variety, repose, and, above all, unity and simplicity. All the rules for the composition of a group—such as the "Blind Fiddler"—hold good for the single figure, bearing in mind that the head is the principal object, to which everything is to be subordinate, which is to receive the sharpest focus, the highest light, and the chief attention; after which the hands will claim consideration. The hands will be found very useful in repeating, in a minor and subordinate degree, the mass of light presented by the face. They have the advantage, in one respect, of not being of so much importance as the face; they may be displayed (always without affectation) if they are fine in form, or they may be hidden if

necessary. Just as, in the "Blind Fiddler," no head is exactly under another, so ought not the hand to be exactly under the head. A great deal of character can be given to the hand if properly treated. Sir Walter Scott, writing to Wilkie of a picture he had seen at Windsor, says, "There was a picture of the Pope, which struck me very much. I fancied if I had seen only the hand I could have guessed it not only to be the hand of a gentleman and a person of high rank, but of a man who had never been employed in war, or in the sports by which the better classes generally harden and roughen their hands in youth. It was and could be only the hand of an old priest, which had no ruder employment than bestowing benedictions."

The action of the figure should be that which is most common to the individual—such a position as shows it to the best advantage. No violent action should be allowed; no appearance of strain. Some photographers seem to think that grace consists of twists, and make spirals of their figures, especially ladies, by causing them to turn their heads over their shoulders and try to look down their backs out of the corners of their eyes. The absurdity and affectation of this position is caused by exaggeration. A position approaching to it, but without the strain, is exceedingly graceful if the figure should be sufficiently easy and pliant to allow of this pose. It cannot be too strongly impressed on the student that the possibilities of the figure must be considered before the attitude is chosen; every figure will not allow of every attitude, any more than a decrepid old man of eighty or ninety could perform the feats of skilful acrobats. Some figures are graceful in one position, while they would be awkward in another, probably still more graceful in a figure it suited. However graceful a figure may appear which has cost some effort in the sitter to attain, it does not compensate for the unaffected air and repose derived from the head and body placed in one direction, as we see in the grand portraits of old men by Titian, Vandyke, and Raphael.

It must not be supposed from this last remark that I advocate that every figure should be presented with the head and body exactly in one direction, although it is very suitable for some persons; but it will be found that a very slight difference of direction between the head and the figure—as in the illustration—will be sufficient to give animation without disturbing repose.



The student will do well to observe attitudes assumed in every-day life, and adapt them to his art. When he sees a beautiful attitude, let him speculate upon the cause of its being beautiful, and he will find that it depends on its consistency with the rules of composition; and although these

rules will not supply him with imagination sufficient to enable him to perpetually invent new arrangements, he will find they aid him very materially in giving expression to his inventions, and will prevent him being extravagant or exaggerated in his arrangements of the form. He should also store his mind with incidents suitable to his sitters, and he may then, perhaps, be able to give less occupation to the eternal book we see in the hands of photographées almost as often as a roll of paper is represented in the statues of statemen.

Remarks on the treatment of the single figure should also contain something on the subject of vignettes, a style of portrait usually confined to the head and shoulders, a kind of picture so simple as apparently to require very little consideration, but I have seen them done so badly that a few words may be of service.

A vignette head should never convey the impression that the sitter was lounging in a chair or leaning on a table; the reason being, that as the chair or table is not visible, the figure would appear out of shape and deformed. As a general rule, the shoulders should appear level, as though the subject was standing. A little variation between the direction of the head and shoulders will always give variety and animation. The lighting should be more delicate than that suitable for other portraits, and the background should always be light. If the white margin to the vignette be very slightly tinted in the light after printing, the delicate effect will be increased; but, when this is attempted, it is usually overdone, and then the effect becomes heady, and worse than if the white paper had been left pure.

In conclusion, make it a constant practice, before removing the cap from the lens, to first give a rapid glance at the sitter to see whether the outline of the figure composes well, that the light and shade is massive and round, and that there appears some indication of the expression you desire on the face of the sitter. If there is a lack of either of these qualities, do not waste your plate until you have got them before your lens.

SOLAR PRINTING ON CANVAS.

MR. ISAAC REXX, of Philadelphia, has recently secured a patent for a process for coating or sensitizing the surface of canvas for printing enlargements upon, by means of the solar camera, by the use of which he claims to get perfect results easily, and without injury to the canvas. He proceeds as follows:—"Take of—

Pure zinc-white	...	...	1 ounce
Albumen of fresh eggs	...	...	1½ ounces
Salt, or chloride of ammonium	...	...	20 grains
Solution of ammonio-nitrate of silver, containing 30 grains of nitrate of silver to each drachm	...	...	4 drachms

"Dissolve the salt in the albumen, then grind fine on a painter's slab the zinc-white in a portion of the albumen, then add the remainder, and mix it uniformly; place the pigment mixture in a Wedgwood mortar, and proceed to the dark-room; then add the silver solution, which will immediately coagulate the albumen; take the pestle and triturate the coagulum until it becomes smooth and pulpy. It is then ready for use. Now take a flat camel's-hair brush about two inches wide, and paint evenly over the canvas or other material with this combination, and it is ready for use when dry; or, if it is desired to print with the solar camera, it is quite as good wet. If a very intense print is required, the coating may, when dry, be subjected to the vapour of ammonia, which will still add to the sensitiveness of the coating.

"This combination is very sensitive to light, and hence due caution must be observed in regard to it, so as not to injure the whites of the picture. It has also the quality of taking very kindly to all kinds of surfaces, oily or not, and may be therefore very easily laid quite free from bubbles or other defects. I have had quite as good results by first

applying the non-coagulated coating, allowing it to dry, then flowing the silver solution over the coating; but this method is not so economical or convenient as the process first described.

The method of preparing the ammonio-nitrate of silver solution is as follows:—Take of—

Nitrate of silver	...	...	1 ounce
Water	...	...	1 "
Pure nitric acid	...	...	2 drachms

Ammonia sufficient quantity.

"Dissolve the silver in the water; remove a small portion, say 1 drachm. To the larger portion add carefully sufficient ammonia to precipitate the silver and re-dissolve the precipitate, guarding against any excess of ammonia. Then add the remaining drachm of the silver solution to insure a decided excess of silver. Lastly, add the two drachms of nitric acid, and the solution is ready for use at any time.

"After the printing process has been carried as far as may be desired, it remains only to fix the impression, which may be done in the usual way, namely, the rinsing away of the free nitrate of silver, and then pouring over the picture a solution of hyposulphite of soda for a few minutes, afterwards removing the hyposulphite of soda by washing the print under a gentle stream."

ON A NEW AND SIMPLE METHOD OF RECOVERING METALLIC GOLD AND SILVER FROM RESIDUES.

BY VICTOR G. BLOEDE, CHEMIST.*

MERCURY has the property of rapidly combining with, or dissolving, as it were, metallic gold and silver, and, in fact, most other metals, forming with them a liquid or pasty mass (according to the amount of foreign metal) which is technically termed an amalgam or "butter." A few drops of mercury poured upon a gold dollar or silver five-cent. piece very quickly dissolves either. When the mercury has taken up a considerable amount of the precious metal from the powdered ore, it is drawn off into bags or large pieces of fine tough buckskin, and then subjected to pressure either between the hands or under a screw. The pure mercury, owing to its extreme permeability, rapidly oozes through the fine pores of the leather, finally leaving in the bag a compact, brittle mass consisting of the precious metals, with a per centage of mercury in combination. To obtain from this crude mass the gold or silver in its pure reguline state the amalgam is placed upon an iron vessel, or, better yet, in an iron retort, and subjected to a low red heat on an ordinary coal fire. The mercury, owing to its extreme volatility, very rapidly evaporates, and, in the course of a few minutes, leaves the precious metals in a state of purity. If the process is carefully managed, as we shall presently describe, there is, however, no danger to be apprehended.

To Reduce Old Baths and Nitrate of Silver Solutions.

Filter the solution of silver proposed to be operated upon until it is clear, and place the filtrate into a clean white bottle of suitable capacity. To each pint of the liquid add 4 ounces or more of mercury, and allow the mixture to remain at perfect rest for a few days. In a very few hours a beautiful sparkling corrosion will be found forming upon the surface of the mercury. This shining deposit consists of perfectly pure metallic silver, and has been called *Arbor Diana*, or "tree of life." It is formed upon the surface of the mercury by what is known in chemistry as double elective affinity, and for each atom of the silver so deposited, a corresponding amount of mercury is acted upon by the nitric acid of the silver, and passes into solution as nitrate of mercury. The deposition continues until all the silver has been thrown down, when we find over it a strong solution of the nitrate of mercury, which may be obtained in the

* Condensed from *The Philadelphia Photographer*.

solid crystalline form by evaporation. In a few days the deposition will be completed, which can be readily seen if the tree ceases to grow; and when the experimenter has become tired of the motto, "A thing of beauty is a joy for ever," &c., and has sufficiently feasted his eyes upon the magnificent sparkling foliage and mossy bark of his shivering tree, he may proceed to draw out its material value. Shake the bottle thoroughly, so that the branches and coruscations of the tree are detached and broken, and brought in thorough contact with the mercury, where the spangles of silver are quickly dissolved. The watery part of the mixture can now be drawn or decanted off from the mercury, and the latter placed in a bag, or, better yet, a large piece of fine tough buckskin, and pressed with force between the hands. When no more mercury can be squeezed through, the bag may be opened and the lump of brittle amalgam removed, and preserved in a well cleaned and stoppered bottle until more has accumulated, or it may be immediately treated as I shall presently direct. In case all the mercury should disappear at the end of the process, a little more may be added to the watery solution to ascertain whether it still contains silver.

MR. WARREN DE LA RUE'S PHOTOGRAPHS OF THE MOON.

THE *Engineer* devotes a long article to the description of Mr. Warren de la Rue's observatory at Cranford, and the photographic appliances employed in securing lunar photographs. After describing the apparatus, which consists of a reflecting telescope with a mirror 13 inches in diameter, and of 120 inches focus, and clock-work movement to follow the moon carefully during the necessary exposure, the photographic arrangements are detailed. We annex some extracts from those portions most interesting to our readers.

"When the moon or a planet is to be photographed with the apparatus already described, the operations begin by selecting a glass plate for the picture. Mr. De la Rue uses the flatted crown plate,* the best glass obtainable for photography, and after receiving a parcel, he rejects all those which contain specks or air-bubbles, so that one-third of the supply is usually at once cast aside. The glass is cut into circular discs $2\frac{3}{4}$ inches in diameter, because the shape of the holder is round, in order not to stop off more of the central part of the aperture than is necessary. Shortly before use the edge of the glass is roughed with a piece of sandstone, such as is used by gardeners to sharpen their scythes. After washing away the grit carefully, the surface of the plate has to be made chemically clean—as good a method as any being to rub it well with prepared whiting and a strong solution of cyanide of potassium mixed up to the consistence of cream, then rinsing it with clean water, and drying and polishing it with a clean cloth.

"The cleaned plate is next coated with collodion, and the choice of a suitable collodion is a matter of some importance. Mr. De la Rue uses good commercial samples of plain collodion, iodized with iodide of cadmium only, and no bromide. The sample of plain collodion chosen should be more limpid than usual, for iodide of cadmium tends to make it gelatinous; it should also give an even film upon the glass, free from structural markings. The sample of pyroxyline from which it is made should be one which does not give a tough, strong film, but a film readily permeated by liquids. An iodide of cadmium collodion, when made from a pyroxyline which gives the highest sensitiveness, is very liable to spots and markings; and pure chemicals, absence of dust, and cleanly manipulations are necessary to get uniformly good results. Mr. De la Rue is very careful to have no traces of sediment in the collodion itself, for he says: 'Collodion should not be sensitized until after it has stood for at least a week after it has been purchased, and it must then be carefully poured into the mixing vessel without disturbing the sediment which is always present. It must be agitated occasionally for some hours after mixing with the sensitizer before it is set aside to rest and deposit the new sediment which forms. After standing

for a month or two it should be carefully decanted for use to the extent of three-fourths into a perfectly clean glass bottle. The plate, having been coated with collodion, is dipped into a bath containing 30 grains of pure fused nitrate of silver to each ounce of distilled water. This bath is perfectly neutral if the nitrate of silver has been carefully fused at the lowest temperature requisite for its fusion.

"The best way of effecting the fusion is to put about 60 grains of crystallized nitrate of silver into a small porcelain dish, heated by an air-flame gas jet, and as soon as the mass has melted pour it into about a quart evaporating basin, previously heated a little over 212° Fahr. (100° Cent.) By a rapid whirl of the basin the fused mass forms a thin ribbon easily broken with a glass rod. When broken it is transformed into a counterpoised stoppered bottle, and weighed at once for use. In preparing the baths the nitrate of silver, 600 grains, is dissolved in 2 ounces of distilled water, and to this a solution of 5 grains of iodide of potassium in about a drachm of water is added. The precipitate at first formed is soon redissolved. Eighteen fluid ounces of distilled water are added, little by little, and the whole agitated. A precipitate of iodide of silver separates, and it is allowed to deposit in the dark for twenty-four hours. The clear liquid is then passed through a filter previously washed with a little nitrate of silver solution. A bath thus prepared is at once in working order. When it becomes less sensitive, as it will do after a time by the accumulation of alcohol and ether and their derivatives, it cannot be restored by doctoring, so that when failures occur it is best to discard the old bath and to have recourse to a new one. Mr. De la Rue usually prepares about a gallon at one time, so as always to have a store at hand, for it may be kept for any length of time.

"The plate having been sensitized, is at once exposed. When pictures of the moon are to be taken the time of exposure varies considerably. When it is full moon and the atmosphere is clear, the pictures may sometimes be taken instantaneously, and in this phase an exposure of from one to two seconds is usually the utmost that is necessary. The moon, as a crescent, would require ten to twenty seconds' exposure under similar circumstances, in order to obtain a picture of the parts visible near the dark limb, and in order to get these dimly-illuminated portions in most perfection the brighter limb of the moon must be somewhat over-exposed. An almost imperceptible mist in the atmosphere will sometimes double the time of exposure. During this operation a clock beating seconds distinctly should be in the room, that the operator may be able to measure the time of exposure with accuracy. The planet Jupiter, when in opposition, is photographed in about five seconds; Saturn in from twenty to thirty seconds. The plate-holder, for exposing the plate to the luminous image, is made entirely of metal, and the circular plate, when placed in it, rests at portions of its edge upon three silver supports. This is a much better plan than letting the wet plate rest upon wood, because in the latter case impurities from the wood often find their way across the solution on the plate, and in the development stains and faults result. The plate-holder is well dried with a cloth before the next picture is placed in it. Above all things, in taking astronomical photographs, it is necessary that the sensitized plate should be placed exactly in the focus of the telescope. The focussing is first done approximately upon ground glass, but finally upon a silvered collodion film placed in the plate holder itself. The latter film is made by sensitizing a plate in the usual way, briefly exposing it to diffused light, then throwing down a light deposit of silver with the developer, washing, fixing, and drying. A few scratches are then made upon the film, which is placed in the holder, the image of the moon is allowed to fall upon it, and the focussing is done from behind, the operator making the picture come to focus on the film, while he makes the adjustments with the aid of a lens sliding in a tube, and in the first instance focussed on the scratches.

"After the plate has been exposed in the camera it has to be developed. Iron developers are of little use when the collodion, as in this case, contains no bromide salt, and Mr. De la Rue rejects them altogether, because he finds that pictures produced with them always show granulation, whilst negatives developed with pyrogallie acid will bear examination under the microscope. To get rapidly it is necessary to employ a weak retarding acid, and to use as little of it as possible. Mr. De la Rue makes his developer of pyrogallie acid 3 grains, glacial acetic acid 1 fluid drachm, distilled water 3 fluid ounces. In very cold weather the above quantity of acetic acid is reduced.

* Formerly he used the extra-white patent plate, but this glass is so hygroscopic that many pictures have been lost by its absorbing moisture and destroying the collodion film; hence the use of this kind of glass has been discontinued.

After the picture has been developed it is never intensified, as in ordinary photographic operations, because some loss of detail in the image is always the result of such treatment, and thin negatives are best to produce enlargements. Lastly, the picture is fixed with hyposulphite of soda, and very thoroughly washed afterwards, for although a very faint trace of this salt left in the film might be harmless for some years, it would eventually cause the destruction of the picture. After the washing, the finished picture is put aside to dry.

"The picture of the moon thus obtained is only about 1 inch or 1 2-10 inch in diameter, according to the distance of the satellite from the earth. The greater the focal length of the telescope the larger would be the direct pictures of the moon obtained, so that with Lord Rosse's telescope it would be possible, by means of good clockwork and high class photographic ability, to get magnificent pictures of the moon between 6 inches and 7 inches in diameter. The great Melbourne telescope is provided with photographic apparatus, and will give pictures of between 3 inches to 4 inches diameter. Mr. Le Suen, who will have the direction of this instrument in Melbourne, has worked at Cranford, so as to familiarize himself with astronomical photography. Such pictures, if obtained, would be of scientific value. Mr. Warren de la Rue finds that parts of the moon which are equally bright to the eye do not reflect the chemical rays equally, for there is considerable difference in the intensity of these parts in the photograph. Jupiter and Saturn, as taken at Cranford, are small specks upon the photographic plate, and require a magnifying glass to show details. Saturn's rings, and the belts of Jupiter, are then distinguishable in the pictures.

"When an astronomical picture has been obtained and finished, it becomes necessary to render it permanent and safe from liability to injury. This is done by cementing a second sheet of glass in optical contact with the picture by means of Canada balsam, so that the film is protected like a fly in amber. A brass plate, about 18 inches long by 9 inches wide, is supported upon four legs, each about 8 inches in length. Lengthways, underneath the middle of the plate, is a gas-pipe with a row of holes along the top, giving a line of little jets heating the plate above. Levelling screws on the legs, and a circular spirit level laid for the purpose upon the plate, enable the latter to be adjusted in a truly horizontal position. The plate of glass is then laid picture side uppermost upon the brass plate, by which it is heated. A small circle, 2 inches in diameter, of plain, clean, patent plate glass, having also been warmed upon the brass plate, is then laid over the centre of the picture, but not so as to touch it, for a slip of thin paper has its end laid under the edge of one side of the upper glass. A few drops of Canada balsam are then allowed to drop upon the lower glass at the point where it is touched by the upper one. The balsam is rendered more fluid by the heat, and slowly travels on its way between the plates of glass, being drawn on by the force of capillary attraction. Slowly does it travel between the plates, and when it has gone a little more than half its journey across, the slip of paper is removed, and the balsam at last fills up the infinitesimal space between the upper and lower plate. This operation requires patience, as it takes about a quarter of an hour before it is complete, and when any feeding with balsam is necessary it should be added to that side where the upper glass touches the lower one. At the close more Canada balsam is applied round the edge of the upper plate, and the cemented picture is left for a little time upon the brass plate that much of the volatile essential oil contained in the balsam may be driven off by heat.

"The very perfect little photographs of the moon, having been taken as thus described, enlarged copies have been made of them upon circles varying from 18 inches to 38 inches in diameter, the latter being about the scale of Beer and Madler's large map. The photographic picture is necessarily the more accurate of the two, from the truthfulness of photography, and from the fact that draughtsmen cannot draw the moon in a short time, so that some portions of their pictures must be taken when the moon has turned itself a little out of its former position with regard to the earth. The copying camera, used to obtain the enlarged pictures, is of the usual construction. It is pointed to the north pole, a shutter opening in the roof of the camera-house for that object, for the sake of the steady light emanating from that part of the heavens, which light is allowed first to pass through a tube, that the rays may be parallel when they fall upon and illuminate the small, transparent photograph of the moon, lying at the bottom of the tube. Inside the

camera, a little below the illuminated negative, is the copying-lens, which throws an enlarged image of the little photograph upon a large sensitized plate at the bottom of the camera. The lens and small negative may be very accurately adjusted with respect to each other, a small microscope being brought into play in the operation. Generally, positives on the scale of 9 inches to the moon's diameter are taken in this way, and the pictures so obtained used for the secondary enlargements. In this copying process, as might be expected, there is some loss, details being visible in the little negative which are not fully rendered in the enlarged copy. Mr. Dallmeyer, the optician, has recently made a lens, which he says he thinks will render every detail without loss, and when it is received it will be rigidly tested."

Proceedings of Societies.

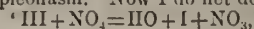
AMERICAN INSTITUTE.

At the May meeting of the Photographic Section of the American Institute, Mr. JOSEPH DIXON in the chair, after some general proceedings,

Mr. E. G. SQUIER detailed some experiences of photography in Central and South America. He expressed his conviction at the outset, that the traveller in the present day could not do his work properly without the assistance of photography. Travellers' tales became travellers' truths when the camera and lens were brought to their illustration and vindication.

He then proceeded to state that having accepted a mission to the Government of Peru, he resolved to take with him a photographer and photographic outfit. Soon after he had arrived in the country of his travels his photographer died, and he says:

"I found myself next day not only alone in the great American Thibet, but encumbered with a bulky apparatus and a large amount of material. To utilize them, I found no instruction except such as is contained in that lively and lucid book, 'Hardwich's Manual of Photographic Chemistry,' including [and here is where the laugh comes in] the 'Practice of the Collodion Process.' If you discover any silver streak in my beard, or other evidences of premature old age, you will now know to what to ascribe them. The last syllable of Mr. Hardwich's name is a pleonasm. Now I do not doubt that



is an exact formula, but it is not altogether a pleasing one to encounter when one is all alone among the Andes, with these mule loads of bottles and other things, which he must try to utilize, or surrender the object of all his labour and outlay.

"How I made baths and collodion in low thatched Indian huts, staining my fingers and spoiling my clothes; how my ether went off with a bang, on the shallow pretext of being too closely approached by the dimmest of all dim tallow dips; how my *Arriero* nearly died from taking a surreptitious swig of Atwood's 95° alcohol, and afterwards nearly murdered me by bringing glacial acetic acid when I asked for vinegar; how—But, gentlemen, if you want to know how, forget all you ever knew about photography, and go up among the Andes when the thermometer is 'steady' at zero, with three mule loads of chemicals and instruments, and 'Hardwich's Manual and Practice.'

"But badiage apart: How photography may be best utilized for the purposes of the traveller, it seems to me, is a problem worthy of engaging the attention of the practical professors of the art. Unfortunately, however, there are few of these professors who know all the difficulties which beset the traveller, especially in remote savage or half-civilized countries, where, perhaps, neither house nor hut is to be encountered for days and weeks, where the weather is forid or freezing, the earth over-shadowed by forests or overflowed by water, or else desolate and dry, and where, always, above all things else, transportation is expensive, difficult, or impossible to be had, and where the baggage of the traveller requires to be reduced to a minimum.

"The traveller does not expect to take fine pictures, to be exhibited as among the highest achievements of photographic art; but he wants to obtain fair results cheaply and rapidly; and to do this he must have his apparatus compact, dispense with tents, be able to get along for a reasonable time at least without water, and with the least possible amount of that heavy and fragile material called glass. He must also be able to do his whole work without assistants, who are seldom to be had, or, when had, are sometimes worse than none at all.

"But above all," continued Mr. Squier, "he wants a manual simple in language, clear in direction, brief as a primer, which shall tell him what to do, and not why anything is to be done. Many travellers have a certain knowledge of chemistry, and most a fair knowledge of things in general; but they seldom have the time or inclination to perfect themselves in photographic chemistry. They want the instruments and the materials, and plain instructions for their use."

Mr. Squier then proceeded to discuss the varying forms of equipment for the traveller, finally giving the preference to something of the character of a manipulating camera like that of Titus Albites, and promised, at an early date, to show one he had contrived. At the conclusion of Mr. Squier's communication the proceedings terminated.

THE PHILADELPHIA PHOTOGRAPHIC SOCIETY.

The monthly meeting of the Photographic Society of Philadelphia was held Wednesday evening, May 6th, 1868, the President, Mr. FREDERIC GRAFF, in the chair.

The minutes of the last meeting were read and approved.

Mr. BROWNE suggested that an appropriation be made from the funds of the Society, to aid the committee appointed at the National Convention of Photographers, held in New York April 7th and 8th, 1868, in their efforts to defeat the extension of the Bromido Patent. The sum of \$20 was appropriated for that purpose.

A paper was read, describing the work of the new Steinheil lens for landscape purposes, by Messrs. DAVIDS and BROWNE, and Mr. Davids made a few remarks about the new wide-angle Dallmeyer rectilinear lens.

Mr. TILGHMAN called the attention of the Society to a new process for intensifying negatives, advocated by Mr. G. Wharton Simpson, by the use of a solution of permanganate of potash. After fixing the negative, wash and place the plate in a solution of permanganate of potash, ten grains to the ounce of water, and allow it to remain for about ten minutes. Mr. Tilghman exhibited a negative, one-half of which had been strengthened in this manner, also a print from the same. The colour of the negative which had been acted on by the potash salt was changed to a yellowish red, almost impenetrable to actinic rays. Mr. Tilghman expressed himself as much pleased with the result, considering the idea of great value to photographers.

After the exhibition of some apparatus the proceedings terminated.

Correspondence.

THE ACTION OF HYPOCHLOROUS ACID IN THE NITRATE BATH.

DEAR SIR,—My attention has been called to a passage in a letter from Mr. Carey Lea to a contemporary which runs as follows:—

"The suggestion made by Mr. Spiller, that the increased sensibility may be due to the formation of hypochlorous acid, seems to be quite incapable of support. For, firstly, it could not even continue to be present. It is an unstable substance, and the solution, if left for several months, as expressly directed by Mr. McLachlan, would not contain an atom of it—it would all have passed into the condition of chloric acid. But even putting aside this chemical difficulty, there is the photo-chemical objection, that neither chloric nor hypochlorous acid could aid in exalting the sensitiveness of the plates. Thus this view can neither be sustained on chemical or photo-chemical grounds."

I am disposed to think that the discussion on Mr. McLachlan's communication is now nearly over, and that photographers will scarcely need to revert to the general question; but in the passage in question Mr. Lea so strangely misapprehends what I have said, that I must ask you to insert a word or two of correction.

The question of increased sensitiveness is for the first time introduced by Mr. Lea. I have never said that the presence of hypochlorous acid would induce increased sensitiveness. I said, on the contrary, that, being a powerful oxidizing agent, it would, if present, prevent fog, and, as all photographers know, bodies which would operate to prevent fog would tend to check rather than increase sensitiveness. I never said that hypochlorous acid was a stable body and would remain in the solution. I suggested that in the decomposition of chloride of silver, hypochlorous acid would be generated, and that its

oxidizing action would aid in removing impurities present in the nitrate, and might so effect in the end that Mr. McLachlan said was produced by the action of light on an impure sample of nitrate of silver, the description of which suggested the presence of chloride. Subsequent examination of a sample handed to me by Mr. McLachlan has confirmed my first conjecture as to the presence of a chloride.—Very truly yours,
Woolwich, June 1st, 1868. JOHN SPILLER.

REMOVING THE COLLODION FILM USED IN TRANSFERRING ENAMELS.

DEAR SIR,—In last week's NEWS I notice that you refer to the difficulty experienced in getting rid of the film of collodion which has been used as a support in transferring the pictures in Joubert's and other enamel processes, as such a film resists the action of the ordinary solvents of collodion.

This difficulty, however, may be entirely obviated by submitting the plate of enamel or porcelain on which the picture, embedded in the collodion film, is mounted, to a gentle heat at first, then slowly raising the temperature, and, when at the proper point, the film, it will be observed, has been consumed. The only care necessary for the success of the operation is that the picture be carefully mounted, with no air-bubbles underneath it, and that the rise in the temperature should be very gradual.—I am, dear sir, yours truly, W. T. WATSON.

Talk in the Studio.

PERMANGANATE FOR RECTIFYING THE NITRATE BATH.—The various reports which have reached us of continued experience with nitrate baths treated with permanganate of potash are decidedly favourable to its use, although in some cases the plates are said to be less sensitive. Mr. Bartholomew writes:—"I some few weeks ago made a bath with rain water treated with Condy's fluid; it worked pretty well, but certainly slower than my usual ones, and on leaving a plate in all night (inadvertently) I had a fine crop of acicular crystals on it. I then made it alkaline, and sunned it for a day, and added about 5 grains chloride barium, filtered, and it works much quicker now, and perfectly free from fog, although I have put no acid in. Next bath I make with distilled water I shall try the chloride barium in place of nitric acid, after Mr. Spiller's experiment."

MAGNESIA TONING BATH.—Mr. Bartholomew also says:—"Do you hear of many that adopt the toning bath made with magnesia? I find it far easier and more certain than any other. I dissolve the gold in aqua regia, and neutralize with common magnesia carb., and it seems always alike, and keeps well."

STOPPING-OUT SKIES, ETC.—A correspondent says:—"Some time since a gentleman advocated smoking the backs of negatives, to obviate imperfections, &c. I find it is the easiest way of blocking-out a negative that I know of. One can follow the outline with a pointed and stiff brush to perfection."

A BANKRUPT PIRATE.—At the Court of Bankruptcy, before Mr. Deputy Hazlitt, William Banks Prince, a printseller, carrying on business at 307, High Holborn, made application for release out of custody. Mr. G. Lewis, Jun., opposed on behalf of Mr. Graves, the well-known printseller and publisher in Pall Mall. He said that the debtor was convicted on the 16th of May, and sentenced to pay nineteen penalties of £5 each for infringing the copyrights of various photographs, engravings, and prints, the property of Mr. Graves, including the copyright of the engraving called the "Railway Station." In default of payment the magistrate directed the debtor to be imprisoned for the period of fourteen days for each offence, and a warrant for his commitment was accordingly issued. Immediately upon judgment being given in the summons in the first case the debtor executed a deed providing for payment to his creditors of 2s. in the pound by instalments. In opposition to the application Mr. Lewis contended that the Court ought not to interfere—certainly not until time had been given for the examination of the debtor, and the creditors said to assent to the deed, which, it was believed, had been concocted for no other purpose than to defeat Mr. Graves. His Honour held that he ought not to delay the release for an indefinite period, pending an inquiry into the deed, and he should grant the application. Mr. Lewis asked that the order might be stayed forty-eight hours, to enable him to appeal, and the Court granted the application.

To Correspondents.

DINSDALE AND CO.—We have received a letter from these correspondents in reply to the recent note of Mr. Griggs on the subject of photo-lithography; but as it is exclusively devoted to the consideration of matters of a personal character, uninteresting to the public, and is discursive in tone, we cannot give it insertion in our columns. In substance, the object of the letter is to deny the truth of a statement, in Mr. Griggs' note, that he had taught Mr. Dinsdale photo-lithography. Whether he did so or not is unimportant to the public. To this denial various allegations of the incompetency of Mr. Griggs are added, which allegations, from the successful public exhibition of his powers, we are indisposed to accept as true, and should therefore act unfairly in publishing the statements. That our correspondents offered to undertake commercially the photo-lithography upon which Mr. Griggs was engaged at the Indian Museum, and that their offer was not accepted, is scarcely a matter of public interest. The letter concludes as follows:—"We hope, Mr. Editor, you will permit us to be present at the printing of the proposed 'silver surface stone,' when we shall be happy to supply your readers gratis with the results so illustrated after the first hundred pulls." Messrs. Dinsdale and Co., in a former letter, intimated that it was impossible to produce a drawing in chalk upon a stone upon which a silver photographic image had been produced. They now suggest that the thing is possible, but that it will not yield more than 100 impressions. This is a question which is more interesting than any personal discussion, and the practical decision of which we hope shortly to be able to announce.

PHOTOGRAPHY.—Mr. England's studio is in St. James's Square, Notting Hill. He does not, we believe, print for the trade.

A LONDONER IN IRELAND.—You are familiar, doubtless, with the various formulae for lime toning baths which we have given from time to time, and lime is the oxide of calcium. The calcio-chloride of gold is a double chloride of gold and calcium.

W. J. A. G.—If you require one lens for all purposes the triple is best, and it has really no fault; but if it be required for landscape only, in which straight lines are not important, a single combination will give a more brilliant image. We should prefer to have both, but if we had to select a lens for universal use, it would be the triple. Exaggerated perspective does not necessarily belong to wide-angle lenses, but is often incidental to their use. It is due to the use of lenses of extremely short focus. If, for instance, you use a wide-angle lens of 10 inches focus, and an ordinary landscape or portrait lens of 10 inches focus, and produce a picture of the same size with each, the quality of the perspective will be the same in both cases. We cannot give absolute advice as to the most suitable lens to get, unless we know what your friend has already, and the subjects to which his attention during his tour will be especially devoted. 3. Of the tents you mention we decidedly prefer No. 2, as combining the greatest number of advantages.

J. R.—As to the keeping of plates by Mr. England's process, much depends on the details of preparation and on the temperature. In hot weather Mr. England used more dilute albumen and more dilute silver solution. He has kept the plates a month or more; but, as a rule, they are better prepared and developed within a week if the weather be very hot. In cold weather they will keep much longer. The general experience seems to be that if they are long kept they require longer exposure.

NZO.—The method we have generally employed in stopping-out a sky when necessary is as follows:—After varnishing the negative, the lower part of the sky to the horizon is stopped-out with water colour, using lampblack generally: a band of about a quarter or half an inch of this is sufficient. The remainder of the sky is then stopped-out at the back, either by means of black varnish, or a mask of blackened silver paper. Sometimes we find that the whole stopping-out can be best effected by a mask of very thin excited albuminized paper, blackened by light. With skill the outline can be sufficiently carefully followed (the image having been first printed on the paper) to place this in contact with the face of the negative.

A. PARRY.—From the irregular shape of the dense spot in the middle of your negative it is not probable that it is flare, unless you were using an improvised and irregularly-shaped stop. It is probably the result of a drop of nitrate of silver having fallen on the face of the negative after the developing solution has been drained off. This would in many cases produce a dense spot. A dirty plate might cause a similar result. 2. The Amateur Photographic Association's address is at 12, York Place, Portman Square, W. Mr. Melhuish, the Secretary, will give you all particulars if you write to him at that address.

R. B.—The chief disadvantage of using only salts of cadmium in collodion is, that they have a tendency to produce a glutinous condition, which renders it difficult to obtain an even film. To obviate this a sample of cotton giving a thin limpid collodion should be employed, or else the collodion should be kept for many months, during which time it gradually becomes more limpid. 2. The quantity of cotton must depend upon its quality. With some samples the collodion is quite thick enough with 3 or 4 grains per

ounce; with others 5 or 6 grains, or more, will be required. We, as a rule, prefer a sample in which 5 or 6 grains give sufficient body. 3. The authority is not trustworthy.

X. X.—The time allowed for either the gallic acid or the gum solution to remain upon the plate before draining is not, we believe, important; about a minute or two in each case. Mr. Gordon's experience is that the film becomes loosened from the plate during the various processes of developing, fixing, and washing, remaining attached to the varnished edge; but not that it blisters. In his experience the finished negative shows no trace of the effect of the loosening, but that it dries evenly without either marks or wrinkles. 2. The extra amount of bromide is to be added directly to the collodion. We will consult Mr. Gordon as to the blistering, and let you know his opinion in our next.

FRED YOUNG.—See answer above. Mr. Gordon's opinion will, doubtless, help you, and we hope to give it in our next.

M. D.—The excessive washing of prints before toning often increases toning difficulties. We prefer a slight washing, but neither the use of a chloride nor a prolonged washing in common water. 2. Always wash the print between toning and fixing. It is a good plan to immerse the print in a solution of carbonate of ammonia before placing in the hypo bath. A long immersion in weak hypo is not desirable. Use a strong hypo bath; not less than one ounce in four of water. Wash the prints well in several rapid changes of water before placing them in the washing machine. 3. It is very much a matter of taste. We generally prefer a warm tone; a good black is suitable to some subjects; but a blue or inky black is, to our taste, always unpleasant.

D. D. D.—Our own experience with the collodio-bromide process is too limited to decide absolutely as to the cause of your difficulties. We have used collodio-bromide made by ourselves, and used without a few hours of mixing, and we have used it after having been made some days by Mr. Sayce, and, in each case, with success. Those who have had experience in the process lay some stress on the bromized collodion having been prepared some time before working. The use of hot water having proved useful in Mr. Sayce's practice, we should recommend you to adopt it, although it is possible to succeed without. 2. The tannin should be allowed to soak into the film for three or four minutes. 3. These plates may be employed for enlarging upon, but the time of exposure can only be learnt by experiment. 4. If you make your own collodion, dissolve the bromide first in the alcohol; if you buy your plain collodion, add the bromide to the proportion of alcohol which would be usually employed as the iodizing solution with the collodion in question.

VIGNETTE.—A very light grey painted in distemper or oil-flattening will give a good background for vignettes. Unbleached calico, without any paint, may be used, but the background must, in that case, be kept some distance behind the sitter. For a curtain, either damask, or moreen, or velvet, or repp, or tabaret, or any of the materials commonly used for curtains in dwelling houses, may be used. Maroon, or brown, or green, may be used with advantage.

LITTLE STUDIO.—The discolouration in the print forwarded is due to imperfect fixation. It has apparently been immersed in a weak or exhausted hypo bath. Use strong fresh hypo solution, and never use it a second day.

MR. WARNER'S MOUNTING BOARD.—We have examined the tinted mounting board, with a sample of which Mr. Warner favoured us. It is found, on testing, to contain a very minute trace of hypo; insufficient, probably, to cause any injurious action, the more so that it is only obtained after long soaking, and is probably due to the white paper which forms the inner portion of the board.

J. H. R.—It is probable that your sample of Castile soap has not been pure, but has contained alkali in excess. The precipitate you have obtained is not pure oleate of silver, but is probably a mixture of oleate of silver and oxide of silver. We find it partially soluble in alcohol, leaving a brown residue, which, on examination, will probably be found to be oxide of silver. The late moment at which your letter arrived does not permit full examination this week. For use with the collodio-bromide of silver you will probably find it less trouble to add a little alcoholic solution of soap to the collodion, or even to add a little pure soap in shavings. We have found that method answer with collodio-chloride of silver. 2. Probably the simplest and most convenient actinometer would consist in a piece of paper prepared with collodio-chloride of silver, and observing the time required to colour to a certain standard light tint.

FOURTH VOL.—We cannot tell you how far it is probable that you will find a market for a series of stereo negatives, nor their probable value; it is a question dependent upon so many circumstances. You can only learn by enquiry of probable buyers. Try the Stereoscopic Company. 2. The patchy effect of red and blue which you describe is due, of course, to irregular toning. This may arise from some imperfection in the paper; or from handling the prints before toning with soiled fingers; or from the prints sticking together in the toning bath. There is no remedy for such defects after they are produced. 3. "Nitrate of magnesium" is simply an incorrect mode of phrasing nitrate of magnesia. We have not tried Newton's printing bath. Several correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Simplified Manipulations in Carbon Printing	277
Small Negatives and Enlarged Prints.....	278
Foreign Miscellanea	279
Photo-zincography in Practice. By J. Waterhouse, R.A.....	280
The Diamond By James Martin.....	281
Pictorial Effect in Photography. By H. P. Robinson.....	282
Inklings from the Workers in Photography. By John H. Hal- lenback	283

	PAGE
Proceedings of Societies—London Photographic Society— Oldham Photographic Society—North London Photographic Association—Photographic Society of Marseilles	284
Correspondence—Practical Experience with some Dry-Plate Processes	285
Talk in the Studio	287
To Correspondents.....	288
Registration of Photographs	288

SIMPLIFIED MANIPULATIONS IN CARBON PRINTING.

THE growing appreciation of the beauty of carbon pictures as examples have become more familiar, and the inevitable conviction of their permanence, which forces itself on candid minds after the fullest examination of the subject, has had a tendency to induce many experimentalists to strive after some simplified method of manipulating, the double process of transfer necessary in Swan's process suggesting at the outset a complication of troubles from which the novice shrinks. That these transferring processes, or any other of the operations, really involve any serious difficulty is, as all who have practised the process a little know, altogether a mistake. When once everything is prepared, and the manipulations understood, the operations are easy, systematic, and certain. Nevertheless, each step towards simplicity will popularize the process, and if simplified methods are possible, it is important to give them the fullest consideration, bearing in mind always that the simplicity which sacrifices one iota of excellence is not worthy of cultivation.

Mr. Arthur Taylor, of Marseilles, recently called our attention to a method of working, which, although yielding less delicate and sharp results than Mr. Swan's, was, he found, valuable for the purpose for which he specially required it—the rendering of architectural subjects. The method he has employed is simply an adaptation of the old method of printing through the paper coated with bichromated gelatine and pigment. The chief difficulty in this method, as those who have worked in this direction know, is, that the paper, being yellow from contact with the bichromate, is so non-actinic that it is almost impossible to print through it; an exposure of some hours being frequently necessary. Mr. Taylor has found that if, after exciting the carbon tissue by immersion in a solution of bichromate of potash, it be transferred to a dish of clean water, the excess of bichromate which stains the paper yellow is readily dissolved out, without removing that which has been absorbed by the gelatine, and which it would require prolonged washing to remove. A piece of tissue treated in this way will print in sunlight, using a calotype negative, in five minutes, yielding a good print.

The other difficulty of this mode of working consists in the loss of a certain amount of sharpness and of delicacy, inevitable in printing through paper, the texture, of course, being necessarily rendered in the print. Mr. Taylor finds this difficulty minimized, and, for architectural purposes, sufficiently removed, by using for the basis of his carbon tissue a thin fine *Saxe* paper, which is comparatively free from structural markings or inequalities. It will be seen that for some purposes this mode of working can be made with scarcely any trouble, and that all transferring is unnecessary. A reversed negative will of course be required.

Regarding some other proposals for securing simplicity, we may quote the suggestions on the subject from the letter of our excellent friend and collaborateur, Dr. Vogel, in our Philadelphia contemporary. He says:—

A drawback to the carbon process, which new beginners particularly are apt to mention, is the necessity of two transferring processes. First, the picture is transferred to caoutchouc paper to be developed, and next, from the caoutchouc paper to white cardboard or paper.

The latter transfer is necessary, on account of the ugly yellow colour of the caoutchouc paper, and also because right and left in the picture would be reversed without it.

The reversion could be overcome by reversed negatives, but the yellow colour of the paper is very objectionable, and this has given rise to the employment of other materials, as resin, for instance, albumen, collodion, &c.

All these experiments started with the belief that an adhesive medium was absolutely necessary; and I myself was of the same opinion.

I demonstrated, however, on a former occasion, that for the transfer of the developed picture from the caoutchouc to the white paper no medium was necessary. Swan went to the useless trouble of covering the paper with gelatine.

This circumstance led me to suppose that for the transfer of the undeveloped pigment film, the adhesive substance might be dispensed with, and experiments in this direction have confirmed the correctness of my views.

Carbon tissue, of Beyrich's manufacture, was exposed under a negative, placed at once in the rolling-press with moist paper, left to dry for an hour, and then developed.

The picture showed perfect on being transferred to white paper, and developed easy, giving all the half-tones. Only at the edges the film showed some tendency to peel off, which, however, could be prevented by proper manipulation.

The whites were faultless. It was curious, however, that the trouble with all beginners, bubbles, made their appearance. This demonstrates, evidently, that the caoutchouc paper is not the cause of bubbles, as has often been stated, but that they are a peculiarity of the gelatine film which forms the picture.

In transferring to caoutchouc paper, they are avoided by long soaking in cold water, previous to development. If, in the new process, they can be disposed of in the same manner or not, I will have to determine by further experiments. The result you shall hear in due time.

The method of mounting the carbon tissue here described, without india-rubber, will, as Dr. Vogel states, require fully verifying in practice before determining its practical value. We have not tried the plan of mounting without any adhesive material, but in the early stages of the process we tried several substitutes for india-rubber, but without in any case sufficient success to induce us to continue the practice. Starch paste, gelatine, albumen, collodion, and solution of shellac were all tried in turn; but none were comparable to india-rubber. We believe that Mr. Swan went through a similar series of experiments with a similar result.

The question of effecting the final transfer without the use of gelatine, and without waiting until the developed print has dried, is interesting; but its success depends upon certain conditions, which should be well understood. In our earliest experiments we attempted this mode of transfer

with success. We found the material of which the developed image was formed, although insoluble, sufficiently gelatinous to adhere to a wetted sheet of paper pressed into gentle contact with it. On mentioning the matter to Mr. Swan he pointed out the difficulties and dangers of this mode of working. The first danger consisted in applying pressure, which might readily destroy the sharpness of the image in the soft and plastic state in which it remains whilst wet after development. Another and more serious difficulty consisted in the fact that a carbon print is really an image in relief, the whites and delicate half-tones forming hollows, and the deepest blacks high ridges. Mr. Swan found that in final mounting some material should be used which would fill up the fine interstices which frequently occurred between two deep ridges of gelatine and pigment, otherwise the contact in the final transfer would be imperfect. This difficulty he subsequently found is, however, got rid of to a great extent by using thin paper in the last transfer, which readily adapts itself to the inequalities of the image, and permits perfect contact. Dr. Vogel has also found that this mode of final transfer without gelatine is practicable and successful.

A mode of transferring without the aid of a press, which Mr. Swan has found successful, is described in his article in our last YEAR-BOOK, from which we may make some extracts here.

Of the various methods of effecting the transfer without the use of a press which I have tried, the following has given me the most satisfactory results:—

After the complete development of the prints, I immersed them in a warm solution of gelatine consisting of—

Gelatine	...	...	...	...	...	4 parts
Water	...	...	...	...	...	100 "

to which may be added (after the solution of gelatine has been effected) one part of a 10 per cent. solution of sulphate of chromic oxide.

In this solution I also immersed the sheets of paper to which the prints are to be transferred. I find it most convenient to have only two prints and two sheets of paper in the solution at once. I draw the prints repeatedly through the gelatine solution, with the view of displacing the water lying upon their surface, and I brush, with a broad camel-hair brush, that side of the paper which will be brought into contact with the print, so as to displace air, and cause the gelatine solution to penetrate the paper. I then draw the brushed surface of one of the sheets of paper into juxtaposition with one of the prints, and similarly the other print and other sheet. This is of course done while the prints and sheets are immersed; and in bringing them together, I take particular care that no air-bubbles are enclosed between. Before their removal from the solution I lay the prints back to back, with the sheets of paper covering them on the outside, and, thus arranged, I slowly raise the pack out of the solution, and suspend it to a line by means of American clothes-pins, and when the prints are partially dry I separate them. When the drying is complete, the caoutchouc paper may be removed as usual, or its removal may be deferred until the print has been mounted upon card.

The paper that I have found best for this process is *very thin*, similar to that used for letter-copying books, but finer in texture and stronger in fibre. It must not be strongly sized. Owing to the ready penetration of the gelatine solution into this kind of paper it will be more or less transparent when dry, and the print will not look well until mounted upon white card. It will not be necessary to treat with alum if the solution of chromic sulphate has been added to the gelatine solution.

One or two precautions must be observed in order to insure success:—

1. In drawing the prints and attached paper out of the solution of gelatine, it is necessary to avoid anything like wrinkling or bulging of the thin paper; this will be accomplished by drawing the prints out of the solution slowly.

2. The prints must not be hung up to dry singly, but in pairs, as described, otherwise the caoutchouc paper will dry more quickly than the thin paper, and, as a consequence of this, will contract, and in doing so will cause the thin paper to pucker.

3. The pairs of prints must be separated before they become so nearly dry as to adhere strongly together.

It is not imperative that the transferring by this method should be done immediately after the prints are developed. The transferring operation may, if more convenient, be deferred until after the prints have become dry.

I would not have it understood that I *prefer* this method of transferring to that in which the press is used, but (at least, until I have had a longer experience of it) I should only recommend this new method where the means are wanting of performing the old one perfectly.

SOME HINTS ON BACKGROUNDS.

In describing the studio of M. Adam-Salomon, we pointed out that much of the fine effect of space and distance in his pictures was obtained by placing one portion of his background screen in shadow, whilst another portion was well lighted, and that a canopy over-head served to cut off top-light from the head of the sitter, and to keep the upper part of the background in shadow.

We recently saw an excellent arrangement for effecting the latter purpose in the studio of Messrs. Robinson and Cherrill at Tunbridge Wells. A canopy attached to the background, and projecting three or four feet, was worked with a cord and pulley with a counterpoise weight, so that the canopy could be placed at any angle, and so regulate the amount of light falling on the head of the sitter and the background screen. If the canopy were allowed to project from the screen at a right angle, it protected the head from a considerable amount of light, and kept the upper portion of the background in shadow. If the string were pulled, the projecting end of the canopy was raised, and more light was admitted, until, when necessary, the whole of the screen became lighted, and a flood of light reached the head of the sitter.

Mr. Robinson had just been using a capital material for painting backgrounds, which, in producing scenic effects, was very valuable, inasmuch as, although it dried perfectly flat like ordinary distemper, it permitted the same kind of working as oil paint, which, from its slow drying, allows the artist to work into the wet colour, producing soft effects difficult to attain in distemper. The vehicle used instead of size was thin flour paste, to one quart of which an ounce of glycerine was added. Those of our readers who produce their own backgrounds will find this vehicle valuable.

Dr. Vogel, speaking of backgrounds and accessories in our Philadelphia contemporary, says:—

The pictures of Adam-Salomon are, with us as with you, the photographic town-talk, and really every new picture of his teaches something new. It is surprising with what simple means the man produces such marvellous results.

Many of our photographers believe that much helps much: pillars, mantelpieces, pilasters, large bureaux, chairs, and tables, are carried together, and one is sometimes surprised how the person managed to find room between all these articles. To leave nothing empty, a screen painted with decorations and flourishes is placed as a background, and, in order to complete the whole, a chandelier, the arms of which look like two horns growing out of the head of the sitter, is suspended from the ceiling.

Of all these gimcracks, Salomon has nothing: a table, a chair, a pillar, perhaps—that is his whole stock of accessories; and what superb pictures he makes with these! I do not mean to condemn all accessories; on the contrary, I acknowledge that there are backgrounds which produce wonderful effects. If we examine the portraits of Reutlinger we will find that particularly those with landscape backgrounds have a wonderful plastic effect.

The rather darkly-painted backgrounds are only superficially executed—I might say, daubed sketches—without any of the details of a picture. At first sight we hardly know if trees or clouds are represented; this sounds paradoxical, but the main point is, the pictures have a good effect.

The figure has a fine plastic appearance, and the want of sharpness in the background is, strictly speaking, an advantage, as it increases the relief of the figure.

My friend, Grasshoff, who is a very skilful background painter, tells me the best colours for backgrounds are Cassel's brown, mixed with more or less washed chalk. All other colours are superfluous. Persons buying a background will often find that some parts take too well—i. e., become too light, others too dark. It is only necessary to rub over the places which become too light a little powdered gold ochre or umber, and to paint the dark spots with some precipitated chalk. Many faulty backgrounds have been doctored in this manner.

SMALL NEGATIVES AND ENLARGED PRINTS.

On Tuesday evening Dr Mann brought before the Photographic Society the mode of working employed by Professor Piazzi Smyth in obtaining his photographs of the Pyramids. This, as some of our readers may know, consisted in the production of negatives about an inch square, with a view to subsequent enlargement. The camera was made

of tin, and was about 8 inches long, upwards of 6 inches, however, acting simply as a hood or screen from the sun. A double combination lens of nearly 2 inches focus was worked at different times with an aperture of one-fifth, one-tenth, and one-twentieth its focal length. As, under the circumstances under which Professor Smyth worked, focussing with such a lens would have been difficult, if not impossible, a measured scale, determined beforehand, was used for adjusting the focus.

The bath, which was the especial feature to which Dr. Mann called attention, was made of ebonite. It was 4 inches high, 2 inches wide, and five-eighths deep, and was so arranged that the plate should occupy a definite and fixed position, as the exposure took place whilst the plate was in this bath, having been, however, previously sensitized in another bath; the whole equipment, besides that already described—collodion, nitrate bath, developing bath, and fixing bath—all being contained in three or four pomade bottles.

The especial reasons for adopting this mode of working in Professor Smyth's case were several. He wished to secure the rapidity of the wet process without its usual impedimenta; and, working at a high temperature and amid clouds of dust, he felt it desirable to effect all the operations and produce a completed negative without exposing the sensitive wet film to the hot and dusty atmosphere.

With the care and precision employed by Professor Smyth, he obtained very good results. The photographs produced from the negatives are transparent collodion positives on glass, enlarged about three diameters, and possessed very respectable definition, confessedly less perfect, however, than that of pictures of similar size obtained direct. The question, how far negatives sufficiently defined to bear enlarging without appreciable loss can be produced by the use of apparatus sufficiently small and portable to be carried by the tourist without inconvenience, is an interesting one, especially to amateurs. With the professional landscape photographer, the production of negatives is the end and purpose of his journey, and to that end trouble is quite subsidiary; with the amateur, the production of negatives is often merely an incident of the journey, and it is desirable that it should not interfere with health or pleasure. The generally expressed opinion of practical photographers on Tuesday night seemed to be that the apparatus was a pretty plaything, and little more. This opinion has been frequently expressed of the apparatus for completing all the operations within the camera, introduced a few years ago in Paris. Nevertheless, we think it not impossible that such a mode of working may be adopted with results sufficiently satisfactory for most amateur purposes. The chief objection we see to the results exhibited on Tuesday night is their unnecessary smallness. Few photographers would be content that their largest finished pictures should not exceed three inches square, and yet the negatives one inch in diameter, and enlarged three diameters, had lost quite sufficient to be appreciably worse than pictures of the same size taken direct. In enlarging, every defect of structure in the original negative is amplified in equal ratio with the image, and this magnified structure gives a degree of coarseness to a small picture which would not be observed in a large picture. A negative of three inches diameter, for instance, enlarged three diameters, would give a fine picture, in which the physical defects of the negative, still being only three times magnified, appear insignificant when compared with the size of the picture. We strongly recommend photographers contemplating working in this direction to bear these facts in mind. Negatives of three inches diameter, taken with care, will yield prints of 10 by 8 inches, in which the loss of definition is no serious pictorial evil; but with negatives much less than this, all results we have seen are far from satisfactory, especially if prints on paper are required.

By far the best apparatus for producing wet plate negatives without a tent which has come under our notice is that invented by Mr. Barrett, and described in our pages a few years ago.

PHOTOGRAPHIC NOVELTIES.

WHILST the pressure of commercial inactivity has been much felt by photographers, it becomes matter of some surprise that so few novelties are attempted in this country, few photographers giving attention to anything outside their own groove. So far as we can learn, the occasional novelties which are introduced from the Continent have a remunerative sale. Surely the hint is worth the attention of some of our readers. Dr. Vogel says:—

"In Germany, photographers have made, of late, quite a successful speculation in a series of original articles, which have found quite a large and rapid sale. To this class belong, particularly, the flower pictures. These are photographs taken from natural flowers coloured with Jacobsen's aniline colours, and either of card or cabinet size.

"Similar are the bird pictures, taken from stuffed birds. The Latin name is printed under these as well as under the flowers, which makes them well adapted to instruction in natural history.

"Still another class are workshop scenes. These represent workshops, with all the men in full activity. For this purpose a whole workshop is built up in the gallery. Stereoscopic pictures are generally taken from these groups.

"Loescher and Petsch are preparing an edition of similar stereoscopic pictures: the most of them represent pretty little girls in various occupations, as reading, gathering flowers, &c., &c. It is curious that none of these speculations are long-lived; for two or three years the pictures will sell well, until some poor photographer will flood the market with miserable, trashy imitations, which are sold for a trifle; for a while the low price will attract purchasers, but when they find that they have been cheated, their taste for the article will be gone."

Foreign Miscellanea.

THE new sensitizing material known under the name of the *Sel Clement* still occupies the attention of photographers in Paris, and in the last number of the *Moniteur de la Photographie* appears a letter from M. J. Laurent, giving his experiences of its employment in large quantities. That gentleman states that in sensitizing 405 sheets of paper he employed 1104 grammes of material, equal to 2.72 grammes per sheet, the paper weighing 20 lb. per ream. The bath used was of 18 per cent. strength, and, therefore, very rich; if a 15 per cent. solution was used, which is amply strong enough, and the paper employed was that in general use by photographers, weighing but 16 lb. to the ream, the *Sel Clement* would be found to be an economical sensitizing agent, as not more than 2 grammes or 2.30 grammes would be expended per sheet. By having recourse to ammonia vapour the tone of the prints gain very considerably in brilliancy, and the printing is greatly accelerated. The sensitized paper is put into a dark box and exposed to the influence of a little ammonia contained in a saucer for a period of three or four minutes; the time and trouble expended in this operation are amply compensated by the rapidity with which the prints are produced and the increased beauty of the pictures.

At a recent meeting of the Marseilles Photographic Society, held on the 1st April last, M. Taylor communicated the results of a series of experiments he had made with a view of obtaining carbon pictures by direct printing. He had carefully studied the influence of a greater or less quantity of colouring matter introduced into the gelatine, and he had obtained the most surprising results by the addition of very minute quantities. By immersing the sensitized paper into a water bath for the period of about five minutes prior to its being printed an improvement in the results was secured, for it was found that the excess of bichromate of potash, which imparted a yellowish tint to the picture and militated against its softness and rapidity of production, was thus elimi-

nated. By this method of proceeding M. Taylor was able to obtain prints possessed of great delicacy. This preliminary soaking in water was objected to at the meeting by M. Vidal, who was of opinion that, although it might possibly be beneficial for thick papers, for a thinner material it was unnecessary and even injurious. He had essayed with sensitized tissue paper, and had found that the process of washing had rendered his material perfectly insensitive. In all these experiments the pictures were produced by direct printing; that is to say, by printing through the paper material.

M. OBERNETTER communicated to the Berlin Photographic Society an account of the success which has attended M. Beyer's (of Warschau) efforts to obtain photographs in colour by M. Niepce's process. M. Beyer used a coating of sulphate of quinine to endow his pictures with permanence, and M. Obernetter was sanguine of being able to render his own paper applicable to the production of these pictures. Dr. Zenker was of opinion that sulphate of quinine was incapable of efficiently protecting the colours, as it had the effect of stopping the ultra-violet rays only; but believed that the Obernetter paper might possibly be employed in the process; and Dr. Vogel reminded the Society that Mr. Simpson had been able to secure colours by his collodion-chloride process.

In the *Mittheilungen*, M. Kleffel publishes a paper on the recovery of silver and gold residues, in which he recommends the covering of operating tables and shelves upon which utensils containing silver solution rest, with filtering-paper, to absorb any spilled liquid, and the reduction of all residues direct into metal instead of first converting them into chloride.

PHOTO-ZINCOGRAPHY IN PRACTICE.

BY J. WATERHOUSE, R.A.

INTRODUCTORY REMARKS.

EVER since the introduction of photography there has been a desire to possess a ready means of superseding the draughtsman and engraver in producing copies of views and works of art, which may not only preserve the accuracy of the photograph, but may be capable of being printed in either of the usual modes, and thus possess the permanence of ordinary prints and engravings. Much has already been done, but we are still searching for a satisfactory method of producing photo-lithographic copies of views, &c., in half-tone. My own opinion is, that no satisfactory results can be obtained in this direction except only for copies of inscriptions and architectural subjects. As regards views, the standards of pictorial beauty in photographs and engravings or lithographs are perfectly different. The dark foregrounds, black masses of trees, and the white patches of water and sky so common in ordinary photographs, cannot be tolerated in the plain black-and-white of a photo-lithograph, in which the delicate half-tones which constitute the charm of the photograph are more or less destroyed. At the same time a photographic image may be produced in half-tone on the stone which can be touched-up by an artist, and satisfactory pictures produced. There is now the less need of any further steps in this direction, since by Mr. Woodbury's beautiful process prints possessing the most delicate half-tones, and identical in appearance with photographs, can be produced as fast as ordinary lithographs. In photo-lithography with half-tones the best results have been produced by MM. Marechal and Tessie du Mothay. Their process, however, can scarcely be called photo-lithography, and but few prints can be pulled. Messrs. Asser and Simonon and Toovey have also produced good results. Some prints I have seen produced by M. Lemerrier, of Paris, who was sometime proprietor of Poitevin's patents, were full of delicacy and softness, but they were copies of plaster casts. In England some excellent results in half-tone have been obtained by photo-zincography at the Ordnance Survey Office, Southampton. There is no great difficulty in the process, but success depends entirely on the quality of the negative and

the suitability of the subject. For those who are interested in this application of photo zincography I shall give a short description of the process as practised at Southampton.

It is now generally recognized that the most useful and successful application of the photo-engraving, photo-typic, photo-lithographic, and photo-zincographic processes is to the reproduction to any required scale of hand-drawings or engravings and other works of art in line. The field for their use is very large, but it is surprising that these processes have not been more extensively practised in England than has been the case.

Their use is almost restricted to a few Government establishments, where the saving of labour and expense has been found to be very great. At Southampton photo-zincography has been extensively used in the reproduction of the national records of England and Scotland, and the Domesday Book. At Woolwich great use is made of photo-lithography to reproduce drawings of artillery material, &c. At the India Museum photo-lithography has been most successfully applied to the reproduction in chromo-lithography of the beautiful tissues and shawl fabrics of the looms of Delhi and Cashmere, and also in copying Sanscrit manuscripts, &c. On the Continent these processes have been far more used than in England, and are practised commercially with the greatest success. Among the photo-lithographers may be mentioned MM. Marie and Lemerrier of Paris, Simonon and Toovey of Brussels, Korn of Berlin; while in France, Messrs. Amand Durand, Placet, Garnier and Salmon, and Baldus have carried the art of photo-engraving to high perfection. Some fine specimens of maps in photo-lithography have been published by the Belgian Government, and, I believe, the same process is extensively used by most of the Continental Governments.

Photo-zincography has also been adopted by the Survey department in India, and is now successfully used in the reproduction of maps for district officers, engineers, &c.

I do not intend to enter into any account of the history of photo-zincography, but simply to give the *practical* details of the process, so as to render it capable of being worked by amateurs. There is a general prejudice in favour of using a lithographic stone in place of zinc, but I think that zinc will be found most useful for amateurs. It is said that corrections cannot be made on the zinc—that it has an unpleasant colour. In practice, however, I have not found any difficulty that might not have occurred with stone. Zinc has the following advantages over stone:—

1. It is cheaper than stone.
2. It is harder and more compact in grain, and, consequently, more readily worked, and resists the etching and pressure better.
3. It is not broken by rough usage or heat, and is more portable and less fatiguing for the workman.
4. Zinc plates can be stowed away in about one-sixth of the space required for stones, and do not require so much care in preserving the drawings from damp and weather.

I believe the cause of the dislike to zinc printing is that the details of working it are not generally known, and I trust these papers may contribute to further knowledge of the subject. The process I shall describe is identical with that practised at the Ordnance Survey Office, Southampton, and of which an account was published some time ago by Sir Henry James. I have lately worked the process practically throughout, at Southampton, and have had some experience of its difficulties in India, which has led me to adopt a few modifications of the original process.

My object is to draw attention to a process which, to judge from the numerous enquiries addressed to the Editor of this journal, is regarded with some interest. I shall endeavour to be as full and clear as possible in my explanations, but if any of my readers require further information on any point I shall be glad to furnish it. If any of my readers have had experience of the process, and can suggest any improvements, I should be glad if they would communicate them. I shall commence by a few general remarks on

THE PREPARATION OF DRAWINGS, ETC., FOR REPRODUCTION.

One of the most useful applications of photo-zuocography is the reproduction of maps and civil and military engineering drawings; but as the requirements of the process are but little known, these drawings are seldom drawn in a suitable manner for reproduction by photography, consequently the results are unsatisfactory, and the process is blamed undeservedly. If care is taken to select suitable subjects, and to secure a good negative, results can be obtained which may compare with engravings in sharpness and delicacy. Success mainly depends upon the negative, which must be perfectly sharp, free from distortion, and possess the greatest amount of contrast between the lines and the ground, the lines being as transparent as the bare glass, the ground almost opaque. Attention to the following points will greatly lessen the labour of the operator, and conduce to success:—

1. The drawing-paper should be as white, clean, and smooth as possible. If the originals are on rough paper they should be passed through a copper-plate press, and, if necessary, cleaned with rubber or bread.

2. The Indian ink with which the drawing is made should be freshly rubbed down, quite black, free from grit and glaze.

3. The lines should be firmly drawn, and *pale ink* must on no account be used. The marginal lines must be well filled in.

4. Washes of any colour, except very light blue, are inadmissible, but *outlines* may be put in with dark burnt sienna, crimson lake, dark green, and similar colours, which will reproduce black.

5. When the plans are intended for reduction, care must be taken to draw the lines of the proper thickness relatively to the scale of reduction; that is, supposing it is required to reduce a drawing to one-fourth the size, it will be necessary to draw every line of the original four times as large as will be required in the copy. This rule is often neglected, and the result is the loss of all the finer lines. The best results are obtained when the drawings are prepared on purpose for reduction, and without any regard to clumsiness of appearance.

6. When practicable, the drawing should be left on the drawing board, so that the paper may remain perfectly flat, or should be mounted in such a manner as to secure flatness. This cannot be done by pinning the drawing to a board; the alterations of temperature will affect the paper, and cause it to expand unequally, and produce ridges. I think it will be found better to fasten the drawing down with tapes, fastened with drawing pins outside the margins of the drawing, and passing tightly over it, so as not to check any lateral expansion.

It is generally better to copy by strong diffused light, as then there is less danger of reproducing the grain of the paper, the removal of which necessitates considerable reintensification to the certain detriment of the negative. Old discoloured manuscripts, &c., are better copied in sunlight, taking care that the sun shines directly on the subject.

(To be continued.)

THE DIAMOND.

BY JAMES MARTIN.

As the diamond is now one of the most useful accessories in the photographer's catalogue of implements, it would, no doubt, be interesting to your readers to learn somewhat of its history and application to the arts. The diamond has, from the remotest antiquity, been prized as the most valuable—or, more properly, the most costly—substance in nature. The reason of the high esteem in which it was held by the ancients was its rarity and its extreme hardness for the art of cutting and polishing; this gem not having been then invented, its superior brilliancy and lustre would not have been appreciated. They also considered it an antidote to poison, and that it was able to cure insanity; therefore it

was called, by some, *anachitis*. Its supposed occult qualities and superstitious uses no doubt contributed greatly to the high esteem in which this substance was held as being the most valuable and beautiful of gems. It was endowed with these hidden virtues in the highest degree; hence it was held to be an infallible specific in many diseases, and, amongst other absurdities a test of conjugal fidelity, a reconciler of domestic strife, and an amulet of highest power against poisons, insanity, witchcraft, incantations, goblins, and evil spirits. The diamond is either colourless, or of a light yellow or smoke-grey, passing into bluish or pearl-grey or clear wine colour, on the one hand deepening into clove-brown, and on the other into yellowish-green. It also occurs of a deep, almost black-brown, Prussian blue, or rose red; and the colourless varieties are the most esteemed, and, next to these, the blue, red and black, the light-coloured the least. The diamond is found crystallized in the regular octohedron, which is its primitive form, composed of two four-sided pyramids opposed base to base, or in the cruciform octohedron. Sometimes each triangular face of the primitive octohedron is replaced by six secondary triangles, bounded by curvilinear lines, in which case the whole crystal has forty-eight faces, and is of a spheroidal figure. Other spheroidal varieties of this mineral are the dodecahedron, a solid of twenty-four faces, and a compressed spheroid resembling a very short hexahedral prism terminated by very short, curvilinear pyramids. The surface of the natural crystal, especially of the spheroidal, is somewhat dull and chatoyant; this appearance, which is generally represented as the effect of a thin crust, appears to be caused merely by the salient edges of the laminae of which the crystal consists. When its surfaces are reduced to perfect smoothness by grinding and polishing, the diamond is of extreme brilliancy, far surpassing every other substance in lustre and the lively play of prismatic colours which dart from it in lines of light whenever its position with regard to the eye undergoes the least variation. The fracture of the diamond is straight foliated; hence it may readily be cleft in the direction of its laminae by a dexterous artist. Some of the spheroidal varieties, however, are composed of curved plates; these are of intense hardness, and cannot be either split or highly polished; they are therefore used by the glaziers and engravers on gems, or are ground into a powder and employed in polishing other diamonds. The specific gravity varies from 3.518 to 3.550.

The diamond, even when rough, acquires by friction the vitreous or positive electricity; it becomes phosphorescent when exposed either to the entire rays of the sun, or to the blue rays alone when separated by the prism and concentrated on the diamond by means of a lens. The diamond when heated to the temperature of melting copper, and exposed to a current of air, is gradually but completely combustible. It is surrounded by a luminous arc during the process. It is wholly converted into carbonic acid, and, therefore, consists of pure carbon. The art of cutting and polishing the diamond was probably known to the artists of Hindostan, and at a very early date, but the only material used in the East for this purpose being wundum, and the apparatus being of extreme simplicity, the jewellers of those countries are incapable of bringing out the peculiar beauty of the diamond in a degree at all comparable to what is effected by European artists.

Formerly diamonds were set in jewellery precisely in the state in which they arrived from India, and hence the octahedrons were much more esteemed than the rest, both on account of the regularity of their figure and the superiority of their polish.

Diamonds are cut and polished by jewellers into brilliants and rose diamonds; the former being for the most part made out of the octohedral crystals, and the latter from the spheroidal varieties. In the formation of either brilliant or rose diamond, so much is cut away that the weight of the polished gem is not more than one half that of the rough crystal out of which it is formed; whence the value of a cut

diamond is esteemed equal to that of a similar rough crystal of twice the weight, exclusive of the cost of workmanship.

The weight, and consequently the value, of diamonds is estimated in carats, one of which is equal to four grains; and the difference between the price of one diamond and another, *ceteris paribus*, is as the squares of the respective weights. Thus the value of three diamonds of one, two, and three carats' weight is as one, four, nine. The average price of diamonds that are worth working is about two pounds sterling for the first carat, and consequently in wrought diamonds, exclusive of the cost of workmanship, the cost of the first carat is eight pounds. The largest known diamond was in the possession of the Great Mogul; it weighs upwards of 279 carats, and is in size and shape equal to about half a hen's egg. Diamonds were more rare, and of course dearer, than they have been since the discovery of the Brazilian mines.

The uses of the diamond are principally in ornamental jewellery. It is also employed by glaziers for cutting glass; by lapidaries, for cutting and engraving upon the hardest gems; and in the finer kinds of clockwork.

The mineralogical situation of the diamond is not very well ascertained. It occurs in India in detached crystals, in a kind of indurated vitreous gravel, not far from the surface of the ground; but whether or not this is its native bed is unknown. The diamond mines of India extend throughout the whole chain of the Ghauts, from Bengal to Cape Comorine. Many of them are totally abandoned, the chief that are now worked being situated between Golconda and Masulipatam.

COMBINATION NEGATIVES.

BY J. B. MIDDLETON.

I THINK all persons who are interested in the development of photography as a fine art will admit the vast importance of the possibility of employing parts of two or more negatives in the production of one picture, for it affords the artist more ample scope for the exercise of his inventive faculties, and enables him to obtain results which would be impossible by other means. Hitherto, I believe, this has always been done in the printing process, whereby, in spite of the greatest care and skill, many proofs are spoiled by the unequal printing or imperfect joining of the parts. Thinking on this matter some time back, it occurred to me that it might be possible to obviate much of this difficulty by the production of what may be called a compound negative in the copying camera by means of converging lenses thus:—

The copying camera must be large, and have a front constructed to carry as many negatives as may be required (perhaps four would be the largest number that could be conveniently used), which should be placed as closely together as possible; of course all parts of the negatives which are not required in the picture must be carefully stopped out. The lenses inside the camera, of which there must be one for each negative, should be mounted in such a manner as to have free motion in all directions (similar to that of a ball and socket joint), and should be provided with screw or other mechanical adjustments, so that they could be readily arranged in any position. Then, by causing the lenses to converge in various degrees, the image of the required part of one negative could be brought to fall exactly on the part of the focussing screen occupied by the corresponding "blocked out" part of another, and a transparent positive could be taken (which, if required, could be improved by hand "touching"), and from that any number of compound negatives might be obtained in the ordinary way. By employing lenses of long focus the angle of convergence would be diminished, and the risk of distortion from using the lenses obliquely would be less.

I do not know whether this idea is new or not, but if there should be any novelty or practical value in it, the photographic world is perfectly at liberty to make the best of it.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XX

"Thus bad begins, and worse remain behind!"—SHAKESPEARE.

"If there be no room, thrust away the meaner parts, and give praise that find room in the chief's portion!"—LAURENCE.

PORTRAITURE—continued.

A GREAT deal of the effect of a portrait will depend on the position the figure occupies in the picture. A glance at the illustrations will show this.

As a general rule, if the head be not equidistant from the sides of the picture, there should be more space allowed before the face than behind, as in Fig. 1. The awkward effect of the reverse of this will be seen in Fig. 2.



Fig. 1.



Fig. 2.

A disregard of this rule has spoilt the effect of many otherwise good pictures. In some photographs we see the figure walking almost out of the picture, for the sake of showing the last coils of the long caudal—almost prehensile—appendages with which ladies sweep the dust, thus sacrificing the head for the tail.

The apparent height of the person represented depends almost entirely on the position of the figure on the plane of the picture. The taller the person, the nearer to the top

should the head be placed, and, if a full length, the legs should be shown. A short person should be brought lower in the picture. In Figs. 3 and 4 the contrast is shown.



Fig. 3.



Fig. 4.

It too often happens that the figure is made much too big for the picture. I have seen so many cartes in which the head nearly touches the top of the picture and the toes the bottom, so that when it was inserted in an album some part must be covered, perhaps a foot cut off, or perhaps half the head. This is done, I suppose, under a mistaken notion of the photographer's that he is giving enough for the money, a principle to which I have no objection, but let the "enough" be in quality rather than in quantity, and he will be right. A carte-de-visite displaying proportion, taste, and a right feeling for art, is of much more value than a life-size picture that does not possess these desirable qualities, whether by painter or photographer.

There has been a notion prevalent that all figures must be taken to scale; thus, if a six feet figure be represented in a carte-de-visite as three inches long (about the right proportion), therefore a child three feet high must be represented as half that height, or one inch and a half. If it be necessary to make elevations of (say) a family, to send to friends at a distance to compare with others taken sometime before, to demonstrate the fact that the children are growing, then this method must be followed, but the photographer should never forget that it is his business to make pictures, and that a figure one and a half inches high will not fill a picture of the usual card size with anything like effect;

I therefore advise that a little licence should be taken in this particular, and that when a child is to be photographed all consideration of how much of the picture would be filled by a grown person, with the camera at a certain distance, be forgotten, and that nothing but the child, the object then before the photographer, should engage his thoughts.

The same disregard of proportion exists amongst landscape photographers; many would prefer to sacrifice effect rather than cut away a little of the foreground, and thus depart from their regulation size.

INKLINGS FROM THE WORKERS IN PHOTOGRAPHY.

BY JOHN H. HALL-NEACE.

Uranian Salt for Positive Printing and Measuring the Actinic Force of Direct Sunlight.

THE above was a communication accompanied by a print from Prof. Joy to the Photographic Section of the American Institute. The positive print was obtained by sensitizing the paper with the oxyfluoride of uranium, and potassium, and formic acid. The print was made by Dr. H. Carrington Bolton, who was the inventor of this method; the specimen was the first and only one taken by this process, and was very indistinct; it was brought forward at this early stage in order to fix the date of the invention.

The picture is composed of the green fluorides of uranium and potassium, and is permanent. Formic acid produces no precipitate in a solution of oxyfluoride of uranium and potassium; but if the acidified solution be placed in the direct rays of the sun, decomposition begins immediately, and a green precipitate of the fluoride of uranium and potassium falls; the precipitate is quite insoluble in water and dilute acids, and could be employed to measure the actinic force of the direct sunlight.

The sensitizing bath is prepared by adding a few drops of formic acid to a tolerably concentrated solution of oxyfluoride of uranium and potassium. The paper, while still wet, is placed upon the negative and exposed to the rays of the sun ten or fifteen minutes. The subject will be further investigated and reported upon.

Mr. Newton gave me his process for making the rival Salomon prints which caused such a sensation. Mr. Newton's pictures are pronounced the most beautiful ever made in this country; and as a great many inquiries have been made as to the manner of making the prints, I shall give it for the benefit of all who wish to advance in the art.

The silver bath is the one first introduced by Mr. Newton.

Silver Bath.

Nitrate of silver	...	...	25 grains
Nitrate of magnesium	...	...	25 "
Nitrate of potass	...	...	25 "
Acetate of lead	...	...	5 "
Water	...	...	1 ounce.

After the bath is mixed and filtered he floated the paper for only half a minute, then dried and toned it for twenty minutes with carbonate of ammonia.

Toning Bath.

He used several different carbonates, such as magnesium, lime, and baryta; but with his 25-grain bath it seems to make no material difference which is used. Of course he used sufficient chloride of gold of his own manufacture, and fixed with hyposulphite of soda, to which he added a few grains of chloride of ammonia; but Mr. Newton thinks photographers do not take time to make fine prints, and most all over-tone these by destroying the beautiful purples which are so essential in albumen prints, and for which Salomon's are noted.

I shall, in your next, endeavour to state other matters which were brought out at the meeting, and will close for the present with the hope that the new process with the oxyfluoride of uranium and potassium will call forth further

experiments by photos. generally, and with Newton's silver bath, careful manipulations, and by using a good quality of paper, the American photos. will still maintain the lead in the beautiful art of photography.—*Humphrey's Journal*.

Proceedings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE closing meeting of the session was held in the Architectural Gallery on the evening of Tuesday, June 9th, Mr. SEBASTIAN DAVIS in the chair.

The minutes of a previous meeting were read and confirmed.

Mr. DUNMORE exhibited a commodious tent for field work, which he designated the "Truck Tent," the dark room and carriage being in combination, or capable of being detached at will. When packed up it consisted of an oblong box, and square box of chemicals, upon an iron truck or frame with wheels and handles. The tent, when opened and arranged for work, consisted of a wooden tray opening like a chess-board, and to which the sides of the tent, made of framework covered with American cloth lined with brown paper biaged together, were fastened by thumb-screws on the inside. The top, similarly constructed, was then laid on and secured by hooks-and-eyes. A tray of mackintosh material is placed on the table for the sake of cleanliness, through which a bent and pointed funnel is thrust to carry off waste solutions. A bag of material impervious to light, open at both ends, was then hung over the open end of the tent, to which it was fastened by tape, for the ingress and egress of the operator. The window consisted of several thicknesses of yellow calico saturated with lac varnish.

Mr. DUNMORE, in answer to various questions, stated that the tent when open gave a working space inside of three feet each way. The total weight of tent, box of chemicals, and contents was about three-quarters of a hundredweight. It was large enough for working 16-inch plates with comfort. He generally intensified and fixed, if necessary, at home. The tent was intended for standing to work. He had an arrangement of cords to which pegs were attached to place in the ground to prevent the tent being blown over by the wind, but he had never had occasion to use it. He could not move this tent about without repacking, an operation which could be performed in five minutes. For large plates it could scarcely be expected that a tent could, when erected, be moved about without packing.

Mr. FRANK GOODE said that Mr. Frith had an arrangement for working large plates 20 by 12, in which the tent and camera were one, all the manipulations being effected inside the camera. He thought that in using a tent standing was best, although some good photographers preferred sitting.—Mr. Frith for instance. He suggested that the chemical box might be converted into a cistern, and placed on the top of the tent with water.

After some general conversation,

The CHAIRMAN, in proposing a vote of thanks, said that the especial point of excellence about this tent seemed to consist in the large working space it gave when opened compared with the small space into which it packed.

After a vote of thanks to Mr. Dunmore,

Dr. MANN read a paper describing the mode of working employed by Professor Piazzi Smyth in producing his photographs of the Pyramids, and exhibited the apparatus, as well as some negatives and enlarged transparencies produced therefrom (see page 278).

Dr. MANN further stated that he, in conjunction with Mr. Dallmeyer, had compared the enlarged pictures produced from these negatives with some of the same size taken direct with a triple, and he was bound to admit that the definition was not so good in the enlargements as in the direct pictures; but still the results were exceedingly good. The especial necessity for the mode of working adopted by Professor Smyth was caused by the circumstances under which he had to work in the Pyramids. With ordinary appliances he would probably have got nothing. The dust would have been a serious obstacle if the plate had not been exposed in the bath. The portability was a great convenience; Professor Smyth was able to carry the bath about hanging on his little finger. The negatives were not quite free from stains.

Mr. SPILLER, referring to the measuring rod which Dr. Mann

had pointed out as included in all the photographs, said that the plan of photographing a rule to serve as a standard of measure in each picture had long been employed in the military photographs taken at Woolwich. In photographs of target practice they photographed a 2-foot rule to aid in estimating the size of the perforations made.

Mr. FOSTER suggested that enlarged collodion positives might be printed from the small negatives in the camera, and transferred to paper in the manner adopted by Mr. Disderi. He wondered that this method of enlargement was not more extensively practised.

Dr. MANN said the same idea had struck him, and he intended to try it with these negatives. He remarked that he had examined some faces in the negatives under an inch power, and in cases where, so examined, nothing appeared but transparent glass, detail and form appeared in the enlarged photograph.

The CHAIRMAN, in proposing a vote of thanks to Dr. Mann, referred to the enlargements as very satisfactory, and expressed a conviction that for amateur purposes the plan in question was worth more attention.

After a vote of thanks to Dr. Mann,

The CHAIRMAN said that the meeting would now stand adjourned until November, when the session would be opened by an exhibition meeting, to which he urged all photographers, members, and others to contribute, as it was only by the excellence of such exhibitions that the public could be made familiar with the real excellence and progress of the art, and become acquainted with its real powers.

The proceedings then terminated.

OLDHAM PHOTOGRAPHIC SOCIETY.

The first out-door meeting of the above Society was held this year at Lymm, on Thursday, June 4th.

The weather (with the exception of a slight breeze) being fine, the party, numbering 35, were in great spirits. Arriving at Lymm, and, after refreshing the inner man, a group was taken, and then separated in search of the picturesque. The dry-plate workers got on very well with their camera and tripod; but, alas! for the wet-plate men, some of them quite agreed with Mr. Beverley on the dry-plate process, that

"Britons never shall be slaves."

At the next ordinary meeting the prints will be exhibited, when we shall have something more to say about the work. We are happy to say that no accident of any kind happened, the whole party arriving safe at Oldham about eleven o'clock, highly satisfied with their trip to Lymm.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE concluding meeting, for the present session, of this Society, was held on the 3rd inst., Mr. COOPER occupying the chair.

Mr. Fox (Stock Exchange) having been admitted a member, the Society proceeded to dispose of business of a private nature, after which the Chairman announced that the first meeting of the next session would be held on the 7th of October.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

THE monthly meeting of this Society was held as usual, M. ARTHUR TAYLOR in the chair.

M. VIDAL, referring to a communication from M. Marion on his new pellicle, stated that he had made one trial with an old negative varnished with lac. The transparent pellicle, instead of being made to float on a plate wet with alcohol, as indicated by M. Marion, was placed on the negative, which had been previously covered with alcohol and allowed to drain. The adherence was perfect, and the water bath, after desiccation, brought about a complete separation of the negative film from the glass. No doubt with new negatives the operation could be performed with the utmost certainty, and there was great advantage in having these transferred negatives, which could be printed at pleasure from one side or the other, like negatives on waxed paper.

The CHAIRMAN showed some good results obtained by carbon printing direct through paper. He had studied the influence of a greater or less quantity of colouring matter introduced into the gelatine, and arrived at surprising results with only a very small amount of it. In these cases the parts impressed were very brilliant, whilst the image was so much deeper

according to the greater proportion of colouring in the gelatine. He had obtained good effects by washing the sensitive paper before printing. That washing (five minutes at most) was for the purpose of getting rid of an excess of bichromate of potash, which made the paper yellow, and was an obstacle in the way of rapid printing. By proceeding in this manner he obtained proofs of great delicacy.

M. VIDAL thought that the preliminary washing would be useful with rather thick paper, but he considered it not only useless, but injurious, when applied to tissues. He had tried it, and found that, in the latter case, the sensitiveness was almost completely destroyed; but he believed that in the case of thick paper there remained, in spite of the washing, sufficient bichromate of potash to maintain the sensitiveness of the layer to be impressed.

The CHAIRMAN said that on a sheet of paper of which one-half only had been washed and the other not, he had observed that the part unwashed exhibited a granular image, while the washed half was free from that imperfection.

M. VIDAL showed some photometric bands obtained in the Vogel photometer. He considered the different degrees of intensity were not sufficiently marked, and that his own plan, which consisted of a series of ten tints only, from white to black, would be preferable. He also showed some fine specimens obtained by the helio-engraving processes of MM. Placet and Baldus; of litho-photography by M. Lemercier; enamel photography by M. Lafon de Camarsac; proofs, carbon (in different tones), by Braun, of Dornach; and coloured photographs by M. Niepce de St. Victor. The engravings of M. Placet were considered the finest of the kind that had been submitted. The very remarkable proofs by M. Baldus were previously unknown. His fine copies of the engravings of Marc Antony were particularly admired. The litho-photographic proofs sent by M. Lemercier, though very fine, did not exhibit any new practical progress in that art, as they were old specimens. With regard to the splendid enamels of M. Lafon de Camarsac, though they were well known, they were not the less admired. The magnificent reproductions of drawings of the great masters, by M. Braun, of Dornach, above all claimed the attention of the Society. His work is already monumental, as the number of drawings reproduced amounts to 3,354. Amongst them are the red lead, sepia, and the grey tones of old china ink, by which the colours of the originals are admirably rendered; and now that we can affirm that all the fine drawings of Raphael, Albert Durer, Leonardo da Vinci, Greuze, &c., are reproduced by the carbon process of photography in a manner that is indelible, it is impossible not to be enraptured with such a result, and not to pay to M. Braun a just tribute of eulogy and admiration. These are the works which elevate the art of photography, and prove that no art ever possessed a more sincere and more powerful auxiliary. The heliographic proofs of M. Niepce de St. Victor, whose first efforts in this direction had already been communicated to the Society, showed fresh progress.

Some votes of thanks terminated the proceedings.

Correspondence.

PRACTICAL EXPERIENCE WITH SOME DRY-PLATE PROCESSES.

SIR,—Believing that landscape photographers in general feel the same interest that I take myself in the perfecting of the dry plate process, and having derived from almost every experience narrated in the *News* some benefit, I desire to return obligation, if possible, and throw the ray of my taper on the subject, still so much in the dark, of the preparation of that unattained desideratum, a perfect dry plate.

I have experimented for nearly four years on all the dry processes I have heard of, except the coffee, which I judge to be substantially the same as the tannin, the extract of coffee producing in action on metals very nearly the same effect as tannic acid.

I have made it a rule to stick to a process until I had mastered all the causes of failure, and produced practically normal results from it, and in so doing have many times exhausted a patience not easily tried. I believe, therefore,

that the result of my *hundreds* of experiments—indeed, I think I might safely say thousands—may be of use, at least in saving time and patience to some who, like myself, have had to work out their system alone, and far from any practical assistance.

I take it that the ideal dry plate must be possessed of the following qualities:—Firstly, it must develop so evenly that an open blue sky will be rendered without a vestige of clouding or unevenness. Secondly, that it should keep at least three months without deterioration or getting uncertain. Thirdly, that they should be equal in sensibility. And, fourthly, that it should develop quickly, and without any tendency to fog. Extreme sensitiveness does not seem to me of great importance, and if a plate will take an impression in less than ten minutes, with a tolerably certain result, I should be satisfied with it on that score.

For the first qualification, I have found the collodio-albumen approach nearest perfection; next to it, Gordon's albumen process; and then the old-fashioned Fothergill. For the second, I have found nothing equal the much-abused tannin. My experimental plates, prepared with bromized collodion, and by Sayce's process, have so invariably fogged or peeled, that I have not gone far in that direction. For the third, I find the tannin and Gordon's about equally reliable; and for the fourth, Gordon's and (except under alkaline development) the tannin; but, as everybody knows, all the albumen processes are free from fog, except with bromized collodion, or when the alkaline development is applied.

The Gordon (albumen) process, on the whole, has given me the most satisfactory results, and, with tannin for certain emergencies presently to be spoken of, will, I believe, satisfy general demands better than any others of which I have thorough knowledge. Nor am I willing to accept the commonly received estimate of either of those processes. I have found the Gordon plates keep longer and resist high temperature better than they are represented to, having obtained spotless and clear transparencies from plates that I have had in my dark room three months; and only a week ago, having some plates that I had prepared over two weeks before and brought back unused from an excursion at that time (since which time they were left in the slides), I took them with me on another, when I was using wet collodion, and exposed them in a difficult ravine, where I could not get my dark box even, and with one of the hottest days of the season (90°, judging from sensation, and for many days about 80° in average exposure). I exposed my four plates, and got four negatives, of one of which I send a proof. Not a spot or mark of decomposition was to be seen on either of them.

The only difference between my manner of preparing the plates and that prescribed in the *Year-Book* is, that after taking the plate out of the distilled water, I flow over it a very weak aqueous solution of iodine, just enough alcoholic solution being dropped into the water to give it the colour of golden sherry, pouring it over and throwing it off twice; and this I do for all processes which require entire ridding of the free nitrate. After the iodine, I wash with a jet of some little force, lest the particles of iodide should adhere. The weaker the iodine solution the better, so long as it converts the whole of the nitrate in the film, which will be shown to be accomplished by the solution retaining its colour. I develop with strong pyrogalllic acid solution, 4 or even 6 grains to the ounce, but never alkaline unless the picture refuses to come out for pyrogalllic, even of the strength of 8 or 10 grains per ounce, and then only add to the developer half a grain of carbonate in preference to liquid ammonia. It is so much easier to restrain than force development, and there is so much less tendency to stain with full exposure, that the waiting of two or three minutes more or less seems of no account. There are few cases in which exposure ranging from four to eight times that of wet collodion may not be perfectly met by the development without losing the value of the highest light. I begin with a solution of pyrogalllic of the strength of about 2 grains, and if the picture

comes out too rapidly with that, wash it off at once, and add to the same 4 or 5 drops of acetic acid; if not fast enough, double the pyrogallie, and continue the action until the details *begin* to appear in the deep shadows, and then strengthen with citro-nitrate of silver and a trace of pyrogallie.

I would always have a few tannin plates by me for interiors, glen scenes, &c., when there is no great amount of flat tint which it is necessary to keep free from spots requiring retouching, or when the sky and distance are unimportant. I am of opinion that more of the failures in this process result from want of cleanliness in the preparation of the plates, and especially in the cleansing of them. The preservative solution being at the same time a reducing agent, the energy of the chemical action is so great that it takes hold of the least provocation to commit irregularities. A glass that will produce a perfectly clean wet collodion negative may cloud and show all sorts of markings with tannin. I clean my plates with nitric acid and water, followed by tripoli, allowed to dry on, and if the plates are not absolutely free from clouding under the breath, follow that with old collodion. I was at one time in the habit of using papier Joseph to finish with, but it is unfit for cleaning for dry plates. I flow with iodine as above, and wash thoroughly, after the tannin, under a jet from a caoutchouc tube and clip, finishing with distilled water; and, in developing, never use ammonia if it can be avoided.

In the preparation of dry plates I never touch the plate with my fingers from the time it goes into the nitrate bath until it is dry. On taking it out of the bath I fold a bit of filtering-paper three or four times double, and, taking the corner of the plate in that, lay it on the atmospheric holder (one of Murray and Heath's, with a T handle), and, when the washing is all done, leave it to drain on the holder in a sloping position, collodion side undermost, until the water has nearly or quite ceased to drip; when, taking it in another piece of filtering-paper, I put it on one corner on blotting-paper (which should be carefully tested for sizing or impurities), resting on slips of glass, as I have had plates spoiled by impurities filtering from the boards under the paper on being wetted by the water from the plate. The draining completely done, and before drying, commence at the upper corner, put it on another strip of clean blotting-paper, and leave it till perfectly dry.

The drying should be done rapidly—as that increases the sensibility—and evenly, otherwise bands and striæ will appear. All apparatus which bring the heating instrument near the plate should be avoided, as one part of the plate will necessarily be hotter than another. I prefer drying on shelves in the dark room, depending on the heat of the room itself, increased, if not sufficient, by a brazier of well-lighted charcoal, introduced before the drying has commenced.

In preparing the tannin solution I shake it up with about a twentieth part of albumen before filtering, which clears it as perfectly as standing months would.

When neither of these processes will meet my wants, I fall back on the Fothergill pure and simple, with an old collodion equal proportions of bromide and iodide, no preliminary coating, short time in the silver bath, distilled water until greasiness disappears, and then about a minute of washing with a fine jet, and washing well after the albumen.

Mr. England's process I have not found so satisfactory as regards cleanness and equality of development as Mr. Gordon's. Much greater precision must be observed in the duration and evenness of the final wash. I think it may be admitted as a general rule that every additional operation merely doubles the chance of defects, and when we can use the nitrate and albumen in one application it seems preferable. For the same reason I have abandoned all preliminary coatings. They are unnecessary with a proper collodion, and give rise to many defects.

Mr. Gordon's gum process (rather, gallic acid process?) I find exceedingly subject to blistering and dust.

The morphine does not seem to me either simpler or

quicker than the tannin, and in my experience is equally liable to markings.

To those who have the necessary convenience for preparing collodio-albumen plates, keeping out of dust, &c., it is a process which can hardly be over-rated, and the means which I have employed successfully for drying the plates may be of interest to those who have not employed some similar experiment. I take one of the cast-iron blocks used for making the waxed photographs, and, putting it over one of the fire-places in the range, or on a common furnace (in the latter case resting on two iron rods across the furnace), and put a spirit-lamp under it. In this way I heat it until it will almost burn paper pressed on it, and then reduce the flame to keep it at this point. As soon as the plates are surface-dry I lay them on three or four folds of blotting-paper on the iron, cover them with a paper screen, which goes over the iron and rests on the rods at each side, removing each one as its place is needed for another. I employ the same after the second sensitizing, and have never found any bad effects from it.

The Norris dry plates I have used with fair success, and find that I can get about eight good negatives from a dozen. They will blister occasionally in spite of all precaution, and are not free from clouding in the skies. I recently exposed the last half-dozen of a lot I received two years ago, and, except for a band of about one-half to one inch wide at the edges, they were almost as good as when they were new. But when a photographer can only get two-thirds of the pictures he goes out for, and may miss the one he wants most, it is not satisfactory working, unless he can go back and try the subject of failure over again, which all tourists cannot do.

I am intending to order a lot of the Liverpool Company's plates, and if you care to hear the result of my experiments, will give it to you.

I have not discovered any new fact or material to constitute the general stock for dry plate information, but hope that my experience may benefit some beginners, and save them time for better things than experimental failures.

Perhaps a modified paper process, which I have found tolerably successful, may be new at least to some of your readers. It consists in using a paper albuminized with a bromo-iodized albumen, and sensitized by floating on an aceto-nitrate bath. It is as quick as the Fothergill process, and gives much more delicate definition than the common paper process, or even than the waxed paper in my hands. I have obtained the best results from an arrowroot positive paper for cleanliness of development, and for detail, with a batch of albuminized paper which had spoiled on my hands, and which I purposed for re-albuminizing for negatives by floating it on a bath of hot (nearly boiling) water to coagulate the albumen, then washing with a soft sponge and warm water, which effectually removes any decomposed albumen or other surface impurity. The albumen is the same as for the collodio-albumen plates, and the same bath. After the aceto-nitrate bath the paper is floated on two baths of distilled water, and hung up to dry. The keeping quality may be improved almost *ad libitum* by more washing, but the sensitiveness is decreased. The development is with gallic acid, but I have used, successfully, the alkaline pyrogallie solution.

I have looked in vain in the YEAR-BOOK and NEWS recently for some details of the glycerine process. Cannot some of the experimenters give us their experience? Will some wet collodion worker give us a formula for instantaneous collodion? I find doctors disagreeing on the proportion of bromide.

Hoping that my communication has not been too long for your patience, and may be of use, I remain, yours truly,

W. G. STILLMAN.

[The glycerine process was first published in our pages. It was contributed by Mr. Blanchard, in December, 1862. It will be found on page 578 of Vol. VI. of the PHOTOGRAPHIC NEWS, and in the YEAR-BOOK for 1863. It is

excellent as a preservative process; but the tendency of practice has been to pursue dry instead of moist preservative processes, on account of the risks from dust, &c., of the latter. We shall be glad to receive our correspondent's further experiences.—Ed.]

Talk in the Studio.

COMPETITION FOR PRESENTATION PRINT.—With a view to secure the greatest novelty and excellence in a presentation print for distribution amongst their members, the Committee of the North London Photographic Association have resolved to advertise for suitable specimens. The detailed conditions of competition will be found stated in our advertising columns this week. From the excellence of the presentation prints this Society has hitherto distributed, a considerable amount of prestige will attach to the selection made in a case of competition. We hope that many very fine examples of the art will be submitted to the Committee.

BIOGRAPHICAL PHOTOGRAPHIC ALBUMS.—The *Stationer* says:—"The photographic album makers may perhaps take a hint from a novelty about to be introduced to the American trade. The article referred to is entitled the 'Biographic and Photographic Family Record, arranged for recording in detail the Personal Incidents of each Member of the Family.' The first page contains the record of the names, birth, marriage, &c., of both husband and wife, and spaces for the photographs of each, to be inserted at several different ages; also space for recording the name, date, place of birth, and death of the parents and grandparents of each, including three generations, and for other incidents in the life of each. The remainder of the volume is appropriated to the records of the descendants of the first-named parties, an entire page being devoted to each, containing the name, date, and place of birth, with space for five photographs at different ages; also for the character and period of whatever diseases they may have had, and the height and weight at different ages, with the schools at which they were educated, occupations, and other events of their lives. An additional blank page for each child enables the parents to record whatever other incidents may seem desirable to be remembered. Now that the album trade is beginning to wane, a new business might be created in an article such as is above referred to."

THE CASE OF PIRACY—Graves v. Ashford.—In this case a rule had been obtained calling upon Alderman Sir R. Carden and Mr. Graves to show cause why the former should not state a case setting forth the facts and grounds of his judgment or determination upon the hearing and conviction of Mr. Ashford, upon thirty-seven separate complaints made by Mr. Graves against Mr. Ashford, for unlawfully selling copies of certain photographs, in which the former claimed to have the copyright. Upon the hearing it was contended that the photographs sold by the defendant were not copies of photographs that had been registered by the plaintiff, but were original photographs, not from the engravings, and further that the particulars of the registration did not contain a sufficient description. Alderman Sir R. Carden, upon being applied to refused to state a case for the opinion of this Court, on the ground that he considered the objections raised by the defendant were frivolous. Mr. Coleridge, Q.C., and Mr. Montagu Williams appeared to show cause against the rule: Mr. Poland and Mr. Talford Salter in support of it. Rule absolute.

NITRATE OF NICKEL IN PHOTOGRAPHY.—It is stated that Herr Wothly, of Aix-la-Chapelle, whose experiments in uranium printing are familiar to photographers, has been recently engaged in working out a process in which nitrate of nickel plays an important part. The details have not been published.

NEUTRAL NITRATE BATHS.—We have received several examples of photography, since our last article on Mr. McLachlan's communication, to illustrate the result of using a perfectly neutral nitrate with bromo-iodized collodion. Several correspondents state that they have avoided free nitric acid, working successfully with perfectly neutral conditions.

PREPARATION OF LITMUS PAPER.—Mr. Vacher says, in the *Chemical News*:—"I have had much trouble in obtaining a thoroughly satisfactory litmus paper. When used with

blotting-paper it is not as delicate as could be wished, and on one occasion, when attempting to make it with sized paper, the blue tincture persistently turned red when it touched the paper. The latter reaction seemed to be due to the sizing material, and it occurred to me that if I sized some paper myself with pure gelatine, my object would be obtained. I can recommend the following receipt:—Digest 20 grm. litmus with 100 c.c. water for some time, shaking occasionally; then filter. To the filtrate add a slight excess of nitric acid, and boil; then neutralise exactly with potash. Now make a weak solution of gelatine by boiling 1 part of isinglass with 50 parts of water; draw white blotting-paper through this, and hang it up to dry. When dry paint one side with the above solution of litmus."

THE FUTURE OF PHOTOGRAPHY.—An able article with this title in *Once a Week* predicts that carbon printing must become universal in the future of photography. After entering into some detail, the writer concludes thus:—"Of the permanency of pictures thus obtained there can be little doubt; the material of them is carbon, one of the most stable pigments known to exist, and the constituent of all the black paints and inks in common use. But it is not necessary that this material alone be used—any colouring matter may be mixed with the gelatine to form the shadows of the print. This constitutes a truly wonderful element in the process, for it allows a drawing to be absolutely reproduced in the very pigment used by the artist. I have seen an Indian ink drawing copied in Indian ink, and a sepia one in sepia; and, better still, a red-chalk sketch duplicated in the chalk used to make it. Photography in its simplest garb is a marvel; but this multiplying of pictures, both in form and in material, by photogenic action, passes beyond the category of marvels, and becomes almost miraculous. As yet, not many photographs of this class are in the market; but they will soon come. Mr. Swan, finding his baby outgrowing his powers of attention, has sold his patent for England to a small company, which is preparing to inaugurate the new system gracefully by issuing copies of a few of the masterpieces of modern English art. Mr. Ward's 'Last Moments of Charles II.,' Mr. Poyuter's 'Israel in Egypt,' and some works of Millais, Ansdell, Maddox Brown, Linton, and others, are in progress of reproduction; and the impressions from these may be looked for as the pioneers of an invading army that must ere long drive the existing class of photographs off the field: copyright holders will then have more serious grounds for alarm at the speculations of the pirates. The forthcoming prints will be called autotypes. In the meanwhile the Continent has gone a little to windward of us. Mr. Swan some time ago sold rights of working the process to M. Adolphe Braun, of Dornach, and went over to give instructions and make arrangements for its practice on a considerable scale. From M. Braun's establishment five hundred prints have of late daily emanated, and arrangements have probably by this time been completed for trebling this number. This indefatigable artist has worked his camera through the galleries of Italy, Germany, France, and elsewhere, and secured thousands of negatives of treasured old masters' drawings. These he has multiplied in absolute *fac simile*, and now, for a few shillings, we may buy a study by Michael Angelo, a design by Albert Durer, or a sketch by Raphael, so accurately counterfeited, that were original and copy placed side by side the eye could scarcely detect a difference between them. Surely this is the greatest triumph that any reproductive art has yet achieved. The British Museum authorities have signified their opinion upon the merits of the new method by ordering the drawings under their charge to be copied by it. M. Braun, too, lately, in his way typified the relative values of the old and new systems by burning every silver print in his possession."

HALO PRINTING.—A correspondent of the *Philadelphia Photographer* says:—"I select a thin piece of glass the size of the negative printed from; next I make a block, either oval or whatever shape I wish it, bevel it on one side, and then glue it on the glass plate, bevelled side down. After I have made my vignette in the ordinary way, I take off the vignette-board and negative, and in their place lay on my glass with the block; this, of course, reverses the order of things, covering up the print where before it had been exposed, and exposing where it had been covered. The block, of course, must be on the centre of your glass, in order to cover up the image, and should extend over the edges enough to leave a white circle between the figure and the outside dark edge. I put to suit the taste, either dark or light. You will notice that this requires no extra printing-frame, as the same can be

used on which the print was made, the springs holding down the glass the same as they did the negative."

AQUEOUS VARNISH. By C. MEINERTH.—If we pour over a wet negative, just after it has been fixed and washed, the usual gum-arabic solution (1 ounce in 8 ounces water), it dries without any gloss, and the rubbing with the finger will produce a mark; but if the negative is allowed to dry first, then flowed with water and the gum solution quickly poured over it, it will leave a hard, glossy surface after spontaneous drying. The reason probably is, that the gum does not enter into the film so much in the latter instance as in the former, and remains a surface-cover, as it should be.

"PHOTOGRAPHY CANNOT LIE."—We have heard of a profligate son dressing himself in rags and being photographed in order to send his father the portrait, and so produce an impression of deep poverty and distress. A recent story illustrates how photography sometimes lends itself to false impressions in another direction. A young man, who received but 1,800 francs (about seventy pounds) a year salary, recently wrote from Paris to his unsophisticated country parent for assistance, and sent his photograph. The father replied, indignantly, "Rascal of a son, you cannot be as poor as you state, for in your photograph you are surrounded by vases, rich curtains, statues, and cascades in perspective. Not a sou from your affectionate father."

To Correspondents.

OXONIENSIS.—From the recorded experience of those who have photographed Alpine scenery, the conditions of success appear to be much the same as in this country. In Switzerland the light is a little better than in this country. You will find it desirable to use a very fully bromized collodion, especially for subjects containing great contrast, such as snow scenery and pine forests. Avoid under-exposure in all cases. With snow and ice, give sufficient exposure and develop quickly. On page 532 of our Eighth Volume you will find some interesting information on the subject.

THOMAS STOTHARD.—The addition of chloride of barium referred to was to form chloride of silver, which, by its decomposition in the process of sunning, which was to follow, would generate hypochlorous acid, which, being a powerful oxidizing body, would assist in eliminating organic matter. Mr. Lea's proposed mixture for cleaning glasses is 1 ounce of nitric acid and 1 ounce of bichromate of potash in 1 pint of water. It is efficacious in cleaning glasses; but it is very corrosive if it touch the skin. We have not yet received the formula for using sulphate of zinc in development.

W. J. A. G.—Our experience with the collodio-bromide process is not very extended; but we have used it after it has been two or three days mixed without disadvantage. The film is generally thin and blue when dry. As a rule, red blotting-paper, if in perfect contact with the backs, will answer to check the abnormal action of light; but painting is better. The method to which you refer requires verifying before it can be recommended. It is doubtful whether it is as certain as the ordinary collodio-bromide process. Failure with England's process, or, indeed, most of the collodio-albumen processes, is scarcely possible.

W. H.—That to which you refer is decidedly the best; we cannot recommend any other.

T. B.—The only conclusion at which we can arrive is that the glass has changed colour by the action of light. The change from an exposure of four seconds to one of twenty-five or thirty seconds in a few years seems enormous; but we have heard of similar cases in which the change in the colour of the glass from the action of light was the sole cause. Are you quite certain that the glass is clean inside and out? Try removing a pane of the glass and examining it, especially comparing the edge which has been protected by the ash-bar with the other portion which has been exposed. The cost of reglazing, if the glass be the cause, will be repaid by the rapidity regained. We are glad that you find the articles on Pictorial Effect valuable.

H. R.—Thanks for the photographs of the Observatory, which are very good. We do not know of anything, but will let you know if we hear of anything suitable.

R. M. L.—The rapid discolouration of your printing bath and the dullness in the surface of the paper indicate that the bath is getting weak in silver, and is consequently dissolving the albumen. The weakness and poverty of your prints is probably due to the same cause; but the print you enclose also suggests that the negative lacks brilliancy, and is fogged in the shadows.

B.—In developing dry plates with iron, different treatment is necessary to that permissible when employing pyrogallie acid. If a

solution of protosulphate of iron, without any addition of nitrate of silver, be applied, it frequently injures or quite destroys the image. This is because it almost invariably contains some trace of free acid, and all acids have a tendency to destroy the latent image. Plain pyrogallie acid solution has no such tendency, because, although called an acid, it is not acid in its properties. Hence it is desirable, in using an iron solution, to add a little of a silver solution from the first. 2. We have not tried iron with collodio-albumen plates. We believe that Mr. England has found it possible to develop his plates by means of an iron solution.

C. M.—You mistake the purpose of adding alcohol to the printing bath. It is not to coagulate the albumen, but to take the place of water, and so reduce the tendency of the water to dissolve the albumen, which it undoubtedly effects. About 3 ounces in a pint of solution are sufficient.

J. G.—The peculiar qualities of the print you enclose are rather due to the lens than the process by which they are produced. The softness, roundness, and depth of definition, and the absence of sharp lines or crisp rendering of wrinkles and texture of skin, are all due to the presence of a certain amount of spherical aberration in the lens. This quality is often useful in lenses for producing large heads; the disadvantage is that, not being under the control of the photographer, it cannot in such a lens be modified at will. The degree in which it is present in the lens with which the large head enclosed has been taken would unfit it for smaller images requiring fine definition. 2. The tone is too cold, according to our taste, otherwise the picture is fine.

B. L.—If the base-line of the picture is the same length as the focus of the lens, the amount of angle included is a fraction over 53 degrees. 2. The triple will give very good effects in portraiture if you have light enough.

X. Y. Z.—Thanks for your well-meant letter; but the matter is unworthy of notice. The remarks to which you refer possess no weight in themselves, and derive none from their source. It is therefore waste of time to give them a second thought, and would be waste of space to enter into the question.

LESSONS IN PICTORIAL EFFECT AND IN SILVER PRINTING.—A correspondent signing "T. M. G.," who wishes to thank us and our contributors for the lessons in Pictorial Effect by Mr. Robinson, and in Silver Printing by Mr. Bovey, sends us some capital card pictures to show that their instructions are not thrown away. The groups are thoughtfully and well composed, and the printing and toning are excellent. Another correspondent writes to say that although he had been associated with art for many years before he became a photographer, he was deeply indebted to the instructions of Mr. Robinson for a much fuller knowledge of the applicability of art principles to photography than he had before possessed. We are obliged to these and other correspondents who write to a similar effect, but they will readily see that we cannot publish letters in full which are simply devoted to kind expressions of gratitude to our contributors and ourselves.

VANITY.—We have no practical experience with hair dyes. If sal ammoniac be employed before the nitrate of silver it will form chloride of silver, which is not required. A weak solution of nitrate of silver applied in the light, followed by a solution of gallic acid, will produce a good dye. Possibly we can give you more details in our next.

J. C. B.—See article in our next.

Several Correspondents in our next.

Photographs Registered.

- Mr. D. RICHARDSON, Darlington,
Photograph of Group of the First Railway Engine, &c.
- Mr. WINTER, Cheltenham,
Photograph of Dr. Barry.
- Mr. WYATT, Fareham, Hants,
Two Photographs of Wymering Church and Choristers.
One Photograph of Vicar of Wymering Church.
One of the Brotherhood of the Home, Wymering.
One of Vicar, May Queen, and the Home, Wymering.
- Mr. TEAR, Clapham Road,
Photograph of Picture "George's Grave."
- Mr. F. C. EARL, Worcester,
Four Photograph of the Reredos in Worcester Cathedral.
- Mr. J. EASTHAM, Manchester,
Two Photographs of Dr. J. Dixon.
- Mr. WYATT, Fareham, Hants,
Photograph of Vicar and Sisterhood, Wymering.
Photograph of Vicarage and Chapel, Wymering.
Photograph of Vicar and Brotherhood, Wymering.
- Mr. WILLIS, Scarborough,
Photograph of O. Farrell.
- Mr. J. ROBINSON, Birmingham,
Photograph of "Little Nell."

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Mr. Gordon's Gum Process	280
Penalties for Piracy not Debts	290
Pictures in a Cup of Tea	290
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	291
Hints on Portrait Photography. By Charles E. Pearce.....	292
Photo-zincography in Practice. By J. Waterhouse, R.A.....	293

	PAGE
Pictorial Effect in Photography. By H. P. Robinson.....	295
Professor Smyth's "Great Pyramid" Bath. By Dr. Mann ...	296
Notes on the Carbon Process.....	297
Proceedings of Societies—South London Photographic Society...	297
Correspondence—Intensifying Negatives—Neutral Toning Bath —Approximate Natural Colours in Photography	299
Talk in the Studio	299
To Correspondents	300

MR. GORDON'S GUM PROCESS.

WE have recently had an opportunity of witnessing some of the exposures of some of Mr. Gordon's gum plates, and examining the negatives produced. It would be simply impossible for anything to be more technically beautiful than these negatives: they are so exquisitely delicate, clean, brilliant, and free from blemish of every kind. Mr. Gordon, who is one of the most extensive and able dry-plate experimentalists we know, after long trial, believes this take it altogether, the most perfect dry process he has tried. In recording this verdict, we ought to add that it possesses much weight from the fact that Mr. Gordon is not only a very extensive, skilful, and conscientious experimentalist, but he is not a claimant for the honours of invention. He has no foregone conclusions to vindicate, no pet bantling of his own, the pre-eminence of which he feels bound to maintain at all hazards. This process, as many others he has worked and improved, he has found in existence in some crude form. He has worked with it, carefully modifying various features, as extensive experience and a keen perception of dry-plate necessities have suggested. This kind of modification is, in many cases, inventing a process; and although, as we have said, Mr. Gordon repudiates for himself such claims, we are compelled for distinction, as the process is distinct from others, to call it Mr. Gordon's Gum Process.

The feature which has astonished us most is the extreme sensitiveness of plates which will keep almost indefinitely. Take a recent example: a portrait was tried on a wet plate with iron development, everything working well: the exposure was fifteen seconds. A gum dry plate was then tried under all the same conditions as the wet plate, and an exposure of twenty seconds was given. After development, both were found to be fully exposed, that on the dry plate being no whit less soft and delicate than that on the wet plate. This, it will be seen, was only one-third longer than the exposure of wet collodion. Mr. Gordon states as his experience that twice the exposure of wet plates is the outside time required. The plates we examined had received various exposures, from two seconds to two minutes; that which had received two seconds, we saw exposed on a group of cattle, and gave a capital negative. As a rule, great sensitiveness and good keeping qualities have been regarded as incompatible; but here are plates which will keep without deterioration during many months, possessing a degree of sensitiveness very rarely found in dry plates. The keeping qualities here, however, seem perfect. Mr. Gordon recently developed a plate which had been kept a month before exposure, and a fortnight after exposure before development. The result was perfect, no shortcoming of any kind indicating that the plate had suffered by the length of time elapsing before exposure and before development.

A recent modification which Mr. Gordon has made has

secured several advantages. Instead of using the alkaline development he originally described, he now uses the gelatino-iron developer. The use of the iron solution makes no modification in the time of exposure, but it is simpler, materially decreases blurring, rendering the use of red paint or blotting-paper at the back of the plate unnecessary, and yields a negative scarcely distinguishable from a wet plate in colour, delicacy, and all characteristics.

The iron developer consists of from 20 to 30 grains of protosulphate of iron, 15 minims of glacial acetic acid, and 1 grain of gelatine in an ounce of water. The gelatine is dissolved in part of the water and the acetic acid, and then added to the iron salt, which is dissolved in the other portion of the water. A trace of silver solution is added—about two drops for a cabinet plate—before commencing the development, and a little more as may be required to bring up the intensity. The negatives have small touches of bare glass on the shadows, showing that where light has not acted there is no reduction of silver. The gradations are delicate and crisp up to the highest light; excessive density or hardness being quite absent.

The iron development has another special advantage: it considerably removes the one failing of gum plates—a tendency in the film to leave the glass. This, with the alkaline development, is, in unskilled hands, at times troublesome, but with the iron is almost entirely absent. Some of our correspondents have complained of the occurrence of blisters during the progress of development, a defect which Mr. Gordon had not experienced. We suspect that the term blister is here employed to indicate the gradual loosening of the film from the plate, which occurs at times, leaving it only attached at the edges by the line of varnish rim round. However, we submitted the letters of two or three correspondents to Mr. Gordon, that they might secure the advantage of his experience as to the defects described. Here is his answer:—

"DEAR MR. SIMPSON,—I cannot account for the blisters your correspondents meet with in the gum process, unless they dry their plates artificially.

"They should always be allowed to dry spontaneously.

"An excess of nitric acid, or the use of acetic acid in the bath, is against adhesion of the film.

"I have never (as yet), I am happy to say, seen a blister on a gum plate; the adhesion is, perhaps, worse with it than with most other preservatives, but it does not with me show this in blisters."

In answer to a question as to the length of time necessary for the preservative solution to soak into the film, he adds,—

"It is quite sufficient just to swill the film for a few seconds with the gallic acid, and then apply the gum, and this latter to be worked about the plate (say) for a minute or so. —Yours faithfully,

R. M. GORDON.

For the convenience of readers, we repeat the manipulations and formula as given by Mr. Gordon in our Year-Book:—

"Any good collodion will answer. Mawson's and Thomas's I have tried, and with 2 grains bromide of cadmium added to each ounce they work well.

"Bath 40 grains to the ounce (*not less*), slightly acid with nitric acid: one drop of this acid to each pint is ample.

"The plates must be left in the bath not less than ten minutes in summer, and probably longer in winter.

"Wash in two baths of distilled water, after which thoroughly under the tap; in fact, all free silver must be got rid of *mechanically*. I do not like doing so *chemically*, either by means of salt or bromide. With the former the negative is never so bright, and, what is still more curious, the plate does not keep so well; while with the latter the sensibility is much impaired.

"Swill finally with distilled water, and flood the plate with a 3-grain solution of gallic acid; drain off slightly, and at once apply the preservative solution, composed as follows, and made up fresh:—

Gum arabic (picked)	20 grains
Sugar-candy	5 "
Distilled water	1 ounce.

This solution should be filtered through a sponge.

"If all the chemicals are in good order, as long again an exposure as for wet collodion will be ample in *summer*; in *winter* I find the *relative* exposure is considerably increased, and that three times will be nearer the mark.

"Although these plates will develop by the alkaline method, they do not do so quite to my liking.

"I have modified it in the following way, when it is everything that can be wished:—

"Developing Solution."

"These I believe will be found on every dry-plate worker's shelf.

No. 1. Pyrogallic acid... ..	96 grains
Absolute alcohol	1 ounce
No. 2. Carbonate of ammonia... ..	96 grains
Water	1 ounce
No. 3. Bromide of ammonia	8 grains
Water	1 ounce.

Previous to commencing the development, run a brush round the edges of the plates charged with a solution of india-rubber in benzole (thick), well wet the film with distilled water, and then take (say for an 8½ by 6½ plate):—

Distilled water	1 ounce
Solution No. 1	10 minims
Solution No. 3	5 "

Pour this over the plate; *allow it to remain on a few seconds only*, and then pour back again into the developing cup; now add to it—

Solution No. 2	5 minims,
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and again apply to the film. The development will now commence, and, if necessary, 5 minims more of No. 2 may be added after some time; if from under-exposure, more of the alkali is needed to bring out the details.

"The slight proportion of bromide added with the pyrogallic solution in the first instance quite checks any developing action that the pyro might, under certain circumstances, possess without it, and on the subsequent addition of the ammonia the image reveals itself slowly, evenly, and completely under command.

"When all the details are out, wash slightly, flush the plate with a little of acid pyrogallic solution as follows, to neutralize any alkali present:—

Pyrogallic acid	2 grains
Citric acid	2 "
Water	1 ounce;

then continue with this and as much of a 30-grain solution of nitrate of silver as may be found necessary to secure the necessary intensity.

"These plates keep perfectly well for months in *summer* before exposure, and I have kept them as long as ten days after exposure; nevertheless, a golden rule is to develop as soon as possible. All these things have been used before; indeed it would be difficult to find something that has not been recommended at some time or other as a final wash for dry plates; but some of your readers may perhaps not be aware of the very excellent results to be obtained by the use of gum *as above mentioned*; and to those I hope to have been of some service in calling their attention to the subject.

"NB.—The backs of these plates should *always* be painted with some non-actinic colour (such as burnt sienna, for instance), for the gum possesses in an eminent degree the property of rendering the film of collodion transparent on drying, causing what has been called 'blurring' to an unmanageable extent in plates not so protected."

PENALTIES FOR PIRACY NOT DEBTS.

An important decision has just been given which tends to make still more stringent the laws against infringing copyrights in works of fine art, and prevents the pirate evading the payment of penalties by becoming bankrupt. In case of failing to pay the amount of penalty inflicted, the alternative amount of imprisonment will, it appears, be strictly enforced. The case is reported as follows in the *Times*:—

COURT OF CHANCERY, LINCOLN'S INN, JUNE 12.

(Before the LORDS JUSTICES OF APPEAL.)

EX PARTE GRAVES, RE PRINCE.

This was an appeal from a decision of Mr. Registrar Hazlitt, acting as Deputy-Commissioner for Mr. Commissioner Goulbourn. The appellant was Mr. Graves, of Pall Mall, the well-known publisher of engravings; the respondent was Mr. William Banks Prince, a seller of prints and photographs in Holborn. On the 16th of May last, Prince was convicted by the magistrate at Lambeth upon nineteen summonses, obtained at the instance of Mr. Graves, under the Copyright Act of 1862, for having unlawfully sold copies of the "Railway Station" and other engravings, of the copyright of which Mr. Graves was the proprietor. Prince was adjudged to pay a penalty of £5 in each case, and was sentenced, under the provisions of the Small Penalties Act of 1865, to fourteen days' imprisonment in each case in default of payment. While the magistrate was giving his judgment Prince executed a deed of composition with his creditors, which contained a release by the creditors, and which was duly assented to, and was registered. Having been arrested under the magistrate's warrant and imprisoned, he applied to the Deputy-Commissioner for his discharge from custody on the ground that the penalties were a debt, from the payment of which he was released by the composition deed. The Deputy-Commissioner held that he was entitled to his discharge, and from this decision Mr. Graves appealed.

Mr. Sargood, in support of the appeal, contended that the penalties recovered under the Copyright Act were of the nature of a punishment for a criminal offence, and were not, therefore, released by the deed.

Mr. Reed, for the respondent, argued that, inasmuch as under the Act the penalties were payable to Mr. Graves, they amounted to nothing more than a debt, which would have been provable under a bankruptcy, and was, therefore, released by the deed.

Lord Justice Wood said that what Mr. Prince had done was, throughout the Copyright Act, treated as an offence—as a fraudulent act for which a punishment was to be inflicted. The penalty provided by the Act was not meant to be the measure of the damage sustained by the proprietor of the picture which had been pirated, as he was permitted to recover damages in another way. The object of the Small Penalties Act was merely to provide a simple method of enforcing the payment of penalties not exceeding £5. The penalty was, in his Lordship's opinion, a punishment for what was in the nature of a criminal offence, and the debtor was therefore not entitled to his discharge from custody.

Lord Justice Selwyn was of opinion that, whether the words or the spirit of the Copyright Act were looked at, the Court was necessarily brought to a conclusion differing from that of the Deputy-Commissioner, whose order must be discharged with costs.

PICTURES IN A CUP OF TEA.

Mr. G. Rockwood, of the Broadway, New York, has addressed a letter on photography to the *New York Evening Post*, in which he describes a tea dry process. The idea is not new, as both tea and coffee were proposed as preservatives

some years ago, but never carried out to any great extent. As Col. Baratti's coffee process has proved very successful, some of our readers will be interested in the precise formula for a tea process. The letter is as follows:—

"I believe you have a sufficient number of readers interested in and practising photography to warrant my sending you a new formula for preparing 'dry plates' for field work and making pictures of interiors. The necessary chemicals, baths, dishes, and paraphernalia for making pictures by the ordinary process are so extensive as to render moving about from place to place quite irksome. To do away with this disagreeable necessity, many processes have been invented for preparing the plates in a laboratory or 'dark room' with some preservative. So complicated have these processes been that amateurs, and, in fact, the professional photographers, are beginning to look upon them as almost impracticable. You will be tempted to smile when I tell you I found the great desideratum in a cup of *English breakfast tea*. Take eight ounces of tea of the ordinary table strength, and dissolve in it about three drachms of crystallized or lump sugar. ('No milk, if you please.') As soon as dissolved, filter, and let settle until clear and cold. Sensitize the plate in the ordinary manner, and thoroughly wash with clean water; then flow it with the saccharine tea solution two or three times, and set it away in a dark closet to dry spontaneously. When dry, expose the plate on the view, about four times as long as in practising with the wet process under similar circumstances. After exposure wash the plate with water, and flow it with a fifteen degree solution of nitrate of silver. Drain for a moment, and develop with photogallic acid. I much prefer the latter. The following is a good formula:—

Pyrogallie acid	...	...	...	2 grains
Citric acid	...	...	...	1 grain
Glacial acetic acid	...	...	...	10 minims
Water	...	...	...	1 ounce

Add no silver to the developer until it is found necessary to force the development to obtain the proper density. Use the plates within two or three days after preparing them. Our grandmothers used to find their fortunes in the bottom of a cup of tea; it is not impossible that we may find some new pastime and occupation there."

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. DOVEY.

TONING BATHS AND TONING DIFFICULTIES, ETC.

To obtain an accurate knowledge of the principles by which a given result is worked out in connection with chemical phenomena requires an absolutely free exercise of thought; and the chief reason why photographers have failed to comprehend the chemistry of their art arises from their proneness to shape their ideas by those of some popular individual, rather than to give free rein to their own perceptive powers, by seeking and striving for themselves. They readily endorse the axiom that nature is truth, but are not so willing to accept those truths which an earnest study of nature's laws alone can impart. There is no royal road to science; she must be sought vigorously and unceasingly, not by the "short cut" usually taken by the majority of men, who borrow ready-manufactured ideas, and consider themselves clever because of their borrowed plumes, but, as before observed, by personal study and independent action of the mind, without which it were vain to attempt one progressive step in the direction of a more perfect knowledge.

Bringing the above remarks to bear on the subject we are called on to discuss, I may here observe that the manifold difficulties connected with toning baths are the fruits of that lethargy or disinclination for the exercise of vigorous and independent research which have caused photographers to cling helplessly to those abominable and unscientifically concocted messes known as alkaline toning solutions,

which, from the tenacity their services are adhered to, seem to possess within them a syren charm to allure their deluded votaries into the most temper-trying difficulties it is possible for man to endure. Be it my business to break through that influence, and to endeavour to persuade my readers to follow me into straighter paths, and to facilitate the accomplishment of my earnest desires; and let me beg of each and all my readers to put aside all prejudices, so that they may follow up the array of arguments I have to offer. I ask no one to believe me because of my word, but I ask that truth may be permitted to prevail, if what I advance is more consistent with science than the doctrines now almost generally followed, and which are daily proved by bitter experience to be based on the extremes of error; and in pointing out the nature of those errors, be it remembered, I cast no reflections on individuals; I thrust every base and selfish consideration aside, and am content to abide by the decisions of mine own conscience.

And now to my task, in the performance of which I shall spare no pains to make the case I offer as comprehensive as words can make it; and by way of caution I ask my readers to avoid running off with an idea that the principles I lay down are erroneous because of their simplicity, or on account of their clashing with the opinions held by their most respected authorities. Allow me, in the outset, to assure you that the theories I hold are based on laboured observation. My observation has found ample exercise in numberless practical tests, and every test applied has been with an object of attaining perfection and a knowledge of the truth. He who would seek truth must dive deep; for

"Errors, like straws, upon the surface flow;
He who would search for pearls must dive below."

We may now withdraw our print from the portfolio, and proceed with the washing. I return to the print singular, that the thread of my last article might be consistently continued. Having effected my object, we will sever the connection, and adopt the plural number, and write of prints in quantity.

Previous to toning operations, the prints must undergo a slight washing—"until all the free nitrate is removed," suggests old notion. No, I reply; I need a little free nitrate to accompany the prints into the toning solution. "But every existing authority condemns such an idea; every atom of free nitrate must be eradicated from the paper ere it is immersed in the gold bath, or farewell toning action." I readily admit those authorities are in some degree right, yet they are considerably in the wrong. Thus I offer a paradoxical nut which I hope by-and-by to crack satisfactorily.

A batch of prints, consisting of fifteen up to thirty sheets of paper, should be passed rapidly through three waters, taking each print singly and passing it quickly into the first water; then from first to second, and from thence to the third and last. With smaller batches of pictures two waters only need be used. The best guide, however, is the appearance of the water used for the washing: the last should assume an appearance similar to milk-and-water. Bear in mind the small amount of nitrate of silver retained by the print has a duty to perform, which will be described anon. Having reached the threshold of toning matters, I purpose, in some measure, dealing with the subject in the form of queries and replies, a mode of procedure which will, I trust, bring the information and descriptions within reach of the meanest capacity. A learned critic once observed that to write down to a reader's capacity is to offer a direct insult. I therefore crave pardon if I err in the plan I have elected to follow, the error I commit being on the safe side.

What is the meaning of the term "toning" as applied in a photographic sense? It is a modification or an entire change of colour produced by gold precipitated on the silver surface in an extremely minute state of division, which, in addition to a change of colour, imparts to the picture a richer appearance; and the original colour of the print may, at the will of the operator, be changed to a sepia, purple, or black.

Can every description of print be made to assume either or all of the tints described? Certainly not. The tone and brilliancy of a print depend, first, on the quality of the negative; second, on the working qualities of the toning bath. Here I would endeavour to correct a popular error concerning the part supposed to be performed by the gold. It is erroneously considered that the richness observable in a well-toned and vigorous print is entirely due to the precious metal deposited thereon. That the idea is incorrect may in a few words be conclusively shown. When a painter is desirous of adding additional richness of effect to any portion of his picture, he first paints a ground-work in some colour obtrusively bright. To subdue, without entirely destroying, the ground-work so produced, he has recourse to "glazing," which consists of a semi-transparent layer of a suitably sombre hue, which sobers down, but does not entirely destroy, the colour beneath. Now it will at once be perceived that the degree of concealment of the under-stratum of paint must depend on the opacity of the glazing medium employed; the more transparent the medium the more brilliant the result, and *vice versa*; and should a strong body pigment be employed, its opacity may be such as to obliterate all traces of the ground-work. Applying the arguments supplied by this illustration to gold toning, I must here observe that the toning bath must be regarded as a glazing medium which should subdue, but in no instance should the gold be permitted to destroy entirely, the red colour beneath. It is a noticeable fact, that the public, as a rule, prefer purple browns and blacks, because of their superior richness. These tints can never be obtained except a sufficient amount of vigour is found in the print when it is taken from the printing-frame. And a print capable of yielding a fine purple-black is capable also of receiving a sufficient body of gold to produce a black free from all warmth. A weak print, formed chiefly of middle tints, and no tint at all for the high lights, may be toned to a sepia: push for blacks, and slatiness results as the precipitate of gold varies with the amount of reduced silver that forms the picture. It is, of course, well understood that the precipitate of gold in any degree of thickness depends on the proper construction of the gold solutions. Some toning baths are capable of destroying the most vigorous of prints, and reducing it to the extremes of miserable slatiness, whilst others cause no visible change: this last would be described as inert, the first as over-active. Allow me to state that the great fault of toning baths generally is over-activity, which causes mealiness, and leads to diversified failures.

Stay! What is that abomination called mealiness? It is the removal of such portions of reduced silver as are situated on the projecting fibre of the paper.

By what agency are such portions of reduced silver destroyed? Bleaching.

From whence arises this devouring power called bleaching? It is introduced into the toning solution with the chloride of gold.

Its name? Chlorine.

Then we may simplify by stating the matter thus:—

1st. Mealiness is the removal of portions of the prints by the action of chlorine.

2nd. Chlorine accompanies the gold used by photographers.

3rd. Remove the cause, and the effect at once ceases.

(To be continued.)

HINTS ON PORTRAIT PHOTOGRAPHY.

BY CHARLES E. PEARCE.*

ALTHOUGH for some time past we have had art photography constantly held before our eyes, at the risk of being thought wearisome I have ventured to bring this subject again before you. I may at once state that it is not my intention to dis-

cuss the productions of men whose works have stamped them as art photographers, and which are well known to you, but rather confine myself to some of the shortcomings, as they appear to me, in the everyday commercially-produced photographs.

The card mania, while it has been the cause of the stagnation at the present time, has unquestionably raised the quality of work—in a technical sense at least—to a higher standard. At the height of the fever it would have been unreasonable to expect the over-worked photographer to pay a great deal of attention to the artistic qualities of his photographs; but now, as quality and not quantity is the one thing looked for, it behoves us to see how far we have improved since that time.

The most important requisites in a good portrait are the pose, the lighting, and the background. While the posing has greatly improved, there being more variety and less dependence on conventional attitudes, and while greater attention has been paid to the lighting, and not without success—for, however photographers may disagree about the form of their studios, yet they are all of one opinion as to the result to be obtained, and at the present time a well-lighted face and figure is rather the rule than the exception—the third requirement, the background, I cannot help thinking has been too much overlooked.

Hitherto, with some exceptions, a perfectly even tint of shade, extending from both sides of the figure to the edges of the picture in one monotonous tone, has been the great desideratum of the photographer, who would sum up all its good qualities in the word "clean;" but I think to this cause is due the uninteresting flatness and want of life to be seen in too many photographs. The lighting may be good, the objects composing the picture may be well arranged; but unless the composition be assisted by the background, there will be a feeling of incompleteness conveyed to the mind very detrimental to the success of the picture, and is, I believe, caused by the absence of the impression of space, which it is impossible to produce with a plain unbroken tint without gradation. As an instance of what a bald background can do, I would ask any one to imagine one of Salomon's pictures with a background of this kind; instead of the gradation of shade helping to concentrate the light on the principal focus, the head, and increasing the contrast, the richness and vigour would be at once lessened, and that completeness as a picture which is one of their characteristics totally destroyed.

I admit that this is one of the most difficult branches of art that the photographer has to encounter, far more than posing and lighting, and is only to be overcome by study of the great masters of portrait painting, of which, fortunately, there are no lack of examples both in the National Gallery and at Kensington. Sir Joshua Reynolds' opinion is well known. To a person who had told him his son was able to paint his own backgrounds, he said: "My good friend, if he can do that he stands in no need of my instruction." It is true that painters have the assistance of colour, and, by the juxtaposition of warm and cold tints, are able to increase contrast, where otherwise the effect would be flat; but the photographer has to depend upon light and shade pure and simple; and, after the light of his studio has done all it can, he must know how to assist nature by art, and be able to place masses of light or shade where needful to increase the effect. It is this power of making these arrangements at will which is so necessary for the photographer to acquire.

In very light backgrounds, if the form be broken, it is possible to obtain delicacy without any effect of tameness, as may be seen in the charming productions of Edge, Notman, and others. These subjects, of course, are not suitable for every person, and, when interiors are represented, I think more would be gained if the background were darker—not heaviness, but more contrast. I think there is a certain amount of truth in the complaint very often made by the sitter to the photographer, that the face is not made

* Read at a meeting of the South London Photographic Society, June 11, 1863.

white enough, and in most cases the fault will be due to the use of a background of an unsuitable tone; and that it is not whiteness which is desired by the sitter so much as that the face should be seen clearly and easily, which is quite legitimate.

In these days of photographic depression, when the support of the public seems to be on the wane, I believe that something different should be attempted in order to keep up the interest, and in this, as well as in other matters, we should do well to remember that unless we advance we are actually going back. The card picture will always keep its place in popular estimation, on account of many qualities, as size and portability, &c.; and I venture to suggest that the old conventional style of *carte*, with its blank background and inevitable curtain, be discarded, and photographers set to work to describe new effects which will act as a fresh stimulus. We have seen that a great deal may be done in the way of double printing. It would be well, therefore, if photographers were to familiarise themselves with the operation; they would be less dependant upon properties and the scene painter, and gradually new ideas would be suggested. With regard to expression, I think more has to be done in that direction, and it is a matter which lies greatly under the control of the photographer. Men of equal ability differ greatly in the amount of influence they are able to exert over the sitter, on which depends a great deal of the success or non-success of the likeness.

I have noticed, on looking through albums, that most of the unfortunate persons who are there placed for exhibition either have the appearance of being in low spirits, or that they were preparing for some agonizing operation; and I am sure that if any means could be adopted to give more animation it would be very desirable.

I do not quite agree with the dicta laid down by some writers, that no friends should be admitted with the sitter into the studio. On the contrary, I have found—especially in those cases in which the face when in repose naturally assumes an uninteresting expression, but which when animated changes as if by magic—that the presence of a third person is very often of assistance, for the sitter naturally converses with less restraint with an acquaintance, and the operator is enabled to study the countenance of the sitter, and to catch a happy expression before it has died away. Of course, more than one or two persons would be very objectionable, and especially with children the rule of exclusion should be strictly enforced; that is, if the photographer values his nerves or peace of mind.

I believe, as a general rule—although I do not lay it down as an axiom—that every face has a predominating expression by which the likeness will be best known. It is this expression which we should endeavour to secure. Care must, however, be taken not to overstep the modesty of nature, and to portray some transient play of the features which, however suitable at the time, would be very undesirable to perpetuate. Simplicity and unaffectedness, although the countenance may be utterly commonplace, will be always sure to please.

In conclusion, I would say that the discussion which ensues after the reading of a paper is often of more value than the paper itself; I have no doubt it will be so in the present instance; and if we gain any instruction and information, the object of this paper will be attained.

PHOTO-ZINCOGRAPHY IN PRACTICE.*

BY J. WATERHOUSE, R.A.

APPARATUS.

I SHALL first consider the special apparatus required for copying, and then enumerate the materials, &c., necessary for the zincographic part of the process. The essential point

to be observed in regard to the apparatus for copying by photography is *absolute rigidity*. The least unsteadiness is fatal to fine results.

The camera must be supported on a firm solid stand; the plan must be fastened to a wall, or carried on a strong stand free from vibration. It is better to have the studio on the ground, as there is always more or less vibration on an upper floor, especially in a city.

Camera.—The camera should be square, of first-rate quality, and is better rigid than of the bellows form. It must be fitted with cones to increase the focal length at least sufficiently to be able to copy a drawing to the same scale, or twice the focal length of the lens.

The lens should be fitted accurately, so that its axis may correspond with the centre of the focussing screen. It will be found convenient to have the screen marked with 1 inch squares round the centre; 4 inches, or 16 squares, will be found sufficient. Their use is to test the squareness of the copy, and also to furnish an aid to the reduction to any given scale; lines passing through the centre at right angles to one another, and divided into inches, will also be found useful.

Lens.—In order to produce perfect copies, a lens must be used which will give a sharp, clear image, perfectly free from distortion. Mr. Dallmeyer has constructed a new lens especially for copying. Several of these have been made for different Governments, and have, I believe, given great satisfaction. The different forms of triplets, the rectilinear lens, and Ross's doublet, may all be used when an image is required perfectly free from distortion. For ordinary work a good portrait lens, or the orthoscopic and similar lenses, may be used. It is generally necessary to use a stop about 5.8 inch, and the image should be focussed midway between the centre and margin. A larger lens should be used than the actual size of the subject requires. Thus, to reproduce a subject 10 by 8 to the same scale, a 12 by 10 or 15 by 12 lens should be used.

Camera Stand.—A solidly made studio stand, with adjustments for giving the camera motion in altitude and azimuth, is required; the base should be rectangular or square, and may be furnished with castors or wheels to run on, or between rails placed at right angles to the plane of the plan-board.

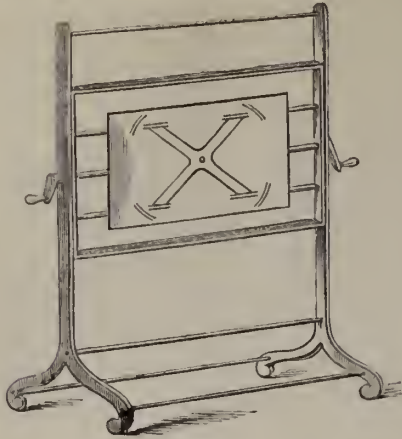
Apparatus for Carrying the Plan while being Copied.—If the subjects to be copied are to be reduced on one plate, or are not of large size, there is no necessity for any special apparatus. A board may be fixed on a wall in a convenient situation, and the drawing fastened to it with the tapes before mentioned, or, if small, it may be pinned on. When, however, it is required to reproduce large plans on the same scale, several negatives must be taken, and an apparatus is required which will enable the plan to be moved vertically and laterally, so that the sections may be brought in front of the lens without altering the position of the camera or unfastening the plan. I devised an apparatus of this kind for the Surveyor-General's Office, Calcutta. It consists of a rectangular iron frame travelling in two vertical grooves, its height being regulated by parallel rackwork, with a detent to stop it at any required height. The iron framework has two horizontal parallel rods fixed in it; on these rods the part carrying the plan-board slides. The plan-board is fixed on a pivot in the centre of two diagonal arms, the ends of which terminate in four arcs, with circular slots in them through which screws are attached to the plan-board, and serve to clamp it in any position. Between these arcs and the centre are fixed the tubular sliders, which run upon the parallel rods. The accompanying diagram will give a better idea than any verbal description.

For use in England this apparatus might be constructed partly in wood, which would be cheaper than iron.

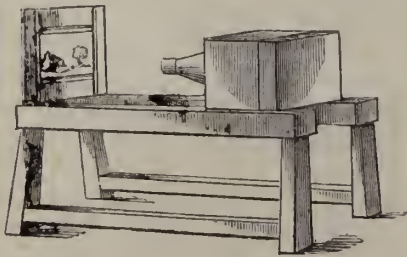
When circumstances will permit, and it is only required to copy small engravings, or to reduce subjects not exceeding about 18 inches square, it is preferable to have camera, stand, and plan-board combined in one solid piece of apparatus,

* Continued from p. 281.

which may be done in several ways according to the size of the camera.



A good form would consist of a strong table frame supported on four or more legs, according to the length. At one end of this the plan-board would be firmly fixed, so as to be at right angles to metal grooves fixed in the sides of the frame, in which the part carrying the camera would travel by means of metal runners. If necessary, the other



end could be left open to admit the operator when focussing, the sides of the frame being held together by iron bracings at points between the part usually occupied by the camera and the board, the legs being cemented together near the bottom.

The plan-board should be marked in one-inch squares, which, with the squares and lines marked on the focussing glass, will be a great aid in ascertaining that the image is perfectly square and of the proper size. A set of Holtzappel's engine-divided scales, on cardboard, will be found useful in measuring the reductions.

A spirit level will be required for adjusting the camera. No other special apparatus will be required for the photographic part of the process.

The following zincographic apparatus will be necessary for those who wish to lay down their own transfers:—A lithographic press; inking table, constructed as a cupboard, to hold the rollers, inks, &c.; inking stones, one for transfer ink, the other for printing ink; lithographic rollers; one or two palette knives for mixing the inks; zinc plates, one polished, others according to requirements; graining sand; mullers for graining the plates; a lump of snake stone and some snake slips; a scraper and eraser for corrections; old linen cloths for damping, &c.; litho printing ink; retransfer ink; turpentine; gum arabic; nutgalls; phosphoric, nitric, muriatic, and sulphuric acids; strong solution of potash; stout demy paper, for offset sheets, &c.; plate paper and enamelled paper for printing; thick bank post paper for transfers: all these may be obtained from Messrs. Hughes and Kimber, of West Harding Street, Fetter Lane, or other dealers in lithographic materials.

I shall give a fuller description of such of these articles as require it when treating of the zincographic part of the

process. Having now described the apparatus required, I will proceed to the details of manipulation.

PREPARATION OF THE NEGATIVE.

As I have observed before, in this process success mainly depends on the quality of the negative, and without perfect negatives perfect results cannot be obtained. It will often happen that copies are required of some subjects of which perfect negatives cannot be obtained. In this case the only thing to do is to obtain as good a result as the subject will permit. The manipulations are the same as those of the ordinary wet collodion process, with which I assume my readers are familiar.

The first point that needs attention is the *focusing*. It is better to do this before fastening the drawing on the board. The first thing to do is to adjust the camera, so that the image of the centre of the board may coincide with the centre of the focusing screen, which, in a properly constructed camera, will occupy the position of the centre of the sensitive plate. Now compare the images of the squares. We will suppose it is required to produce a copy half the size of the original: to do this, the position of the camera must be altered till a square eight inches in the side *exactly* occupies the square of four inches in the side marked on the focusing screen. When this is the case, the surface of the board and that of the sensitive plate will be perfectly parallel. The drawing is now fastened on the board, and the sensitive plate got ready. The glass plate, being thoroughly cleaned in the usual way, is coated with bromo-iodized collodion containing very little bromide (only just sufficient to secure cleanness in working is required; a good iodized collodion may sometimes be used with advantage when everything is in good order); it is then sensitized in a 35-grain bath of nitrate of silver, faintly acid with nitric acid. The exposure must not be prolonged, or there will be danger of deposit on the lines; it must be carried just far enough to produce as much intensity as possible on the ground of the negative, while the lines remain perfectly free from deposit. The developer is as follows:—

Protosulphate of iron	...	...	...	1 ounce
Glacial acetic acid...	...	...	...	1 "
Alcohol	...	...	...	$\frac{1}{2}$ "
Water	...	...	...	1 pint

I have found the addition of gelatine or glycerine, as recommended by Mr. Nelson Cherrill, advantageous in keeping the lines clear, and increasing the density. The development must not be carried too far. The plate is fixed in a 15-grain solution of cyanide of potassium, and examined by daylight. If the lines are perfectly clear, the re-intensification may be proceeded with; but if the lines are not quite free from deposit, Mr. Osborne's *clearing* process may be used with great advantage. The cyanide having been well washed off, the following solution is applied to the plate:—

Iodide potassium	...	...	...	2 grains
Iodine	...	...	...	1 grain
Water	...	...	...	1 ounce

It is allowed to act about a minute, and washed off; the plate is then covered with a weak solution of cyanide, the effect of which will be to clear the lines very much. If this treatment should not produce the desired effect, it will be better to try another negative, giving less exposure, or not carrying the development so far. The plate is washed, and again covered with the iodine solution, which is washed off almost immediately; and care must be taken to wash the plate thoroughly before proceeding to the re-intensification.

Re-intensifying Solutions.

1.—Pyrogallie acid	...	...	...	4 grains
Citric acid	...	...	...	4 "
Acetic acid	...	...	...	15 minims
Water	...	...	...	1 ounce
1.—Nitrate of silver	...	...	...	20 grains
Water	...	...	...	1 ounce

Two or three applications of the re-intensifying solutions

will, in most cases, give sufficient density, but there is great danger of clogging the lines. It is better only to apply the pyro and silver once, and obtain the necessary density by a change in the colour of the deposit, rather than by any additional deposit. The pyro having been thoroughly washed off, the plate is immersed in a saturated solution of bichloride of mercury, where it remains till it is quite white; if there are fine lines, the action should not be carried beyond the dark grey stage. It is then well washed, and a diluted solution of hydrosulphate of ammonia is poured over it, which instantly changes the colour to a dense russet black. The plate is again thoroughly washed, and, when dry, varnished in the usual way.

In the course of my experience in India I found that if citric acid was used in the re-intensifying solution the film was extremely liable to split when immersed in the bath of bichloride of mercury. I therefore sought a means of replacing the bichloride of mercury, which is undesirable for several reasons, using the following solution, recommended by Mr. Carey Lea.

Cold sat. sol. bichromate pot.	...	3 fl. drachms
Hydrochloric acid	...	1 drachm
Water	...	6 ounces

This solution is poured on after the plate has been re-intensified with pyro; it quickly changes the colour of the film to a bright lemon yellow, and appears to somewhat clear the lines. It is washed off, and the hydrosulphate of ammonia is applied, which changes the colour to a dense chocolate brown.

The only point to which attention need be drawn is the necessity of thoroughly washing the plate after each stage of the operation, for unless this be done the lines will be stained or covered with deposit, and the negative rendered useless.

Faults in the negative may be partly remedied by dusting out transparent spots and stains with lampblack, &c.; and when the nature of the film will admit, broken and closed lines may be opened by the dexterous use of a sharp needle or etching point.

(To be continued.)

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS. BY H. P. ROBINSON. CHAPTER XXI.

"Grouping.—My advice to photographers on the subject is something similar to *Punch's* celebrated advice to persons about to marry: 'Don't!' Except in very small pictures, it is almost impossible to secure a satisfactory group of more than two persons at once by photography. It tasks the skill and attention of the photographer quite enough to see that the arrangement, lighting, and expression of one figure are perfect."—*Refrinder*.

PORTRAITURE—continued.

The composition of a portrait group depends very much upon the character of its constituents. Two or three children, if they are not excessively stupid samples, are very easy to group together, and, when well done, make the most agreeable and natural pictures; while two adults, especially of the male kind, although easier to photograph, seldom make an effective composition.

The great art in the composition of a group is in so arranging the figures that they shall have some relation to each other, as well as the ordinary elements of pictorial construction. There should be some bond of union between those who compose the group; some incident should be represented in which they are mutually interested; or something must be imagined out of the picture to attract the attention of both, if only two are represented, or of many of them, if there is a number. The figures should be massed together, and not scattered over the picture so as to make it necessary to examine each portrait in detail, until it has been seen, and the effect agreeably felt, as a whole. Nothing has a more disagreeable effect than two figures in one pic-

ture which may be cut in two without much injury to either half. Two figures, like Enid and Geraint in the wild land,—

"Apart by all the chamber's width, and mute
As creatures voiceless, thro' the fault of birth,
Or two wild men supporters of a shield,
Painted, who stare at open space, nor glance
The one at other, parted by the shield."

It is not necessary in representing two persons in conversation, that they should be looking at each other; the effect of listening can be rendered without that. It constantly happens that in conversations even on the most important subjects, the talker and the listener do not look at each other, although, even if the sounds were not heard, it would be obvious from their appearance that the persons were in conversation. One point which should command the attention of the student is, that there should be variety in the heads, not only as regards profile, three-quarter, or full face, but in their position on the paper. Thus, it is difficult (although possible) to obtain much pictorial effect out of two figures of exactly the same height standing together; in such a case variety must be got in the lines of the different figures by varying the direction of the bodies, by the arrangement of the arms and hands, and by the disposition of the accessories and background.

As an example of the possibility of this, I give an illustration taken from a photograph of two young ladies, alike in height and general appearance. It will be noticed that the subject is extremely uniform—two young ladies standing, with an upright post and mass of foliage, very nearly alike, forming the entrance to the arbour, on each side of them; yet a very slight alteration in the almost corresponding sides of the picture has made it a pleasing and agreeable composition.*



It is by the amount of perfection with which he succeeds with groups that the photographer will discover the power that is within him. If, after repeated attempts, he fail, or do not succeed to his satisfaction, he will do well to confine himself as much as possible to vignette or medallion heads, a style demanding some taste and care, but taxing the artist much less than more elaborate compositions. Many photographers have so studied the best methods of treating the

* Our engraver has given the background a more pronounced character than it possesses in the photograph, which is not an improvement.—Ed.

head, and the head alone, that they have succeeded to admiration, and attained high reputation by this class of work. They have preferred to succeed by doing a simple style well, rather than a more complex style imperfectly.

Some artists prefer to have to make a group of three persons rather than two. I confess that the more figures I have to deal with in portrait photography, the more difficult I find my task. More than three or four figures should never be attempted in one negative, if it is necessary that every person should be a good portrait. I leave out of consideration here, large out-door groups taken on the hit-or-miss principle. It is impossible to get more into an upright carte-de-visite without crowding. I have seen a dozen or more figures in a card portrait; but we are speaking of composition here, not of figures thrown together in a heap, with a head appearing here and there just as it gets the opportunity. If more than four figures must be included in the small dimensions of a carte-de-visite, it would be much better to turn the camera on its side, and make a horizontal picture of it. I have seen some most delightful little gems of pictures of this kind by Angerer, in which the interior of a large drawing-room of people—full, without crowding—was represented. I should much like to see pictures of this kind introduced into England, but the large size of the glass room required would, I fear, prevent all but a few attempting them.

When the picture is larger than a carte-de-visite or cabinet size, it is always better and much easier to produce a group by combination printing. Photographers appear to have been afraid of the difficulties of this method; but I am glad to see it is coming very much more into use, as photographers obtain a more intimate knowledge of the capabilities of their art. To accomplish this, a sketch should be made of the composition, no matter how roughly done, so that the artist knows what he intended by it, when he looks at it a second time; or the figures may be placed in position, and a small photograph taken of the arrangement. They should be so grouped that the joinings should come in unimportant places. Although it is possible to make a perfect join, even in such a difficult place as down the line of a delicate profile,* it is better, if possible, to keep the mechanism of the art out of sight. When a sketch or small photograph of the complete arrangement is obtained, the groups or single figures should be photographed in detail, by preference against a white or very light screen, if a background is also to be put in. If the background is to be an interior, it will be found most convenient to take it with the figures, the accessories being so arranged that the lines of junction will not be seen.

A natural background may be introduced behind a single figure with great effect, and Mr. Edge has lately shown that it may be used with advantage for pictures so small even as a carte-de-visite.

PROFESSOR SMYTH'S "GREAT PYRAMID" BATH.

BY DR. MANN.†

Through the kindness of my friend, Professor Smyth, of the Royal Observatory, Edinburgh, I had the opportunity and pleasure of showing the members of the Society the bath with which the Professor made the miniature photographic pictures in Egypt when preparing his work on the "Great Pyramid;" and also to submit to the observation of the Society a small series of the miniatures themselves, and of the enlargements made from them.

In order to prevent any misapprehension, it may be right that I should here state what has been distinctly said elsewhere, that Professor Smyth does not claim originality either for making very small photographs, or for the exposure of the plate when in the nitrate of silver bath.

* In the presentation print I am now doing for the Photographic Society, I have purposely arranged a join down the outline of a profile, to show that it is possible. The copies are being printed entirely by assistants, and not five per cent. are discarded for defective joining.

† Read before the London Photographic Society, June 9th.

I believe the Professor himself frequently speaks of Mr. Skaife as having been before him in the suggestion and making of very small pictures under brief exposure, and of exposure while in the bath having been one of the ideas of an early age of the photographic art. If there had been time and opportunity, I would have made an endeavour to bring Mr. Skaife's proceedings into review in connection with Professor Smyth's mode of working upon this occasion. I may possibly find some other occasion to do this. My immediate purpose at this time is simply, as I had recent occasion to allude to the Professor's mode of working, 1st, to show our London friends the bath which the Professor used in his Egyptian campaign; and, 2nd, to afford Mr. Dallmeyer, and any others who may feel interested with him in that bearing of the question, to examine the optical character of the small pictures.

It may be necessary, before drawing attention to the bath and the pictures, here briefly to recapitulate the peculiarities of the process adopted on the occasion of this Egyptian excursion by Professor Smyth. The camera used was made of tin, 8 inches long, of which $6\frac{1}{2}$ inches was composed of a hood or sun-shade. The lens was a kind of locket-lens, a double combination of 1·8 inch focal length, which was worked with apertures one-tenth and one-twentieth of the focal length. The focus was adjusted, not by the eye, but by the instrumentality of a graduated scale determined beforehand. The light was cut off from the picture by a screen of blackened tin, placed, not in front of the lens, but just before the sensitive plate, and so contrived as to qualify the exposure of different parts of the plate and moderate the "sky-action."

The bath, which I here produce, is made of ebonite, and is externally 4 inches high, 2·5 inches broad, and 1 inch thick. Its internal capacity is 3 inches by $1\frac{1}{2}$ inch and $\frac{3}{4}$ inch. The bottom is so inclined as by its form to keep the plate in contact with two platinum pins provided for its lower end. A third point is so placed above as to enable a wedge inserted behind to bring the picture-plane into its proper position and keep it there. In front of the plate there is a little window 1 inch square, composed of a piece of very carefully prepared glass, having exactly true and parallel sides, and possessing a brass shutter of its own, which is closed when the bath is not in use. The bath has a cover of ebonite, with a ring on the top, by means of which it can be carried upon the little finger when the operator is at work.

The Professor's battery of apparatus consisted of half-a-dozen broad-mouthed bottles, and a pair of steel and of ebonite pliers. The glass upon which the picture was made was simply the microscopic object-slip, measuring 1 inch by 3 inches. This was inserted into the bath and wedged into position, one end downwards, so that the inch square picture ranged transversely across its middle third. The operation consisted mainly in a series of dippings. The plate was first dipped into one of the bottles containing the collodion, then dipped into an ordinary nitrate of silver bath contained in bottle No. 2. It was thence transferred to another portion of the same solution contained in the exposing-bath, next placed in the camera, and there exposed for a period varying with the aperture from a fraction of a second to twenty seconds. After the exposure there was a third dipping, in the iron-solution bottle; a fourth dipping, in a water-bottle; and a fifth dipping, in cyanide-of-potassium solution, followed by a final washing.

The difficulties which Professor Smyth turned the flank of, or avoided, by his mode of working were:—(1) the partial drying of the plate at the edges in temperatures sometimes as high as 90°, with 25° of difference between the readings of the wet-bulb and dry-bulb thermometers; (2) the dusting of the moist plate with clouds of dust and fine sand otherwise unavoidable in the circumstances in which the Professor worked; and (3) the encumbrance of the more complicated apparatus ordinarily employed in excursion photography.

It was stated upon the authority of Mr. John Nicol, who presented a detailed account of Professor Smyth's apparatus and mode of working to the Edinburgh Photographic Society in the year 1866, that some of these inch-square miniature negatives bore magnifying up to 15 feet very much better than the best pictures of larger size ever before shown to that Society.

Two of the miniature pictures shown—those, namely, of the broken corner of the coffer in the king's chamber of the Great Pyramid—were taken with the magnesium light, with an aperture one-fifth of the focal length of the lens. Nine others of the miniatures were taken with an aperture one-tenth of an inch focal length, and five others with an aperture one-twentieth of the focal length.

Professor Smyth has drawn my attention to a curious fact in regard to these negatives. Some of them were intensified with persulphate of uranium, and have been solarized and become quite translucent, but are not at all solarized to chemical rays, as they still give intense pictures, with sharp black-and-white detail.

NOTES ON THE CARBON PROCESS.

MR. A. J. DRUMMOND, writing to *Humphrey's Journal*, says:—

In the last number of your valuable Journal, a carbon printer asked for information, "to prevent Swan's carbon tissue cracking before and after sensitizing; also, to prevent bubbles on the tissue when developing?"

My experience with Swan's carbon tissue has been the same as that of your correspondent; so much so that on sensitizing in the evening, in the morning I found it curled and cracked so badly that it was almost impossible to use it. I tried various remedies; my first was to sensitize in the morning, and expose when sufficiently dry, without adhering to the negative; this worked well for a few sheets; but where a number were to be done, the result would be as above, owing to the length of time required in exposing. Then I resorted to another expedient, steaming, and that I found to be very dangerous, as it was apt to adhere to the negative. At last, almost discouraged by my numerous unsatisfactory experiments, I made a trial of rock candy, which resulted in a highly satisfactory manner. Let your correspondent try this formula, and report the result. To every 12 ounces of bichromate of potash solution I added 4 ounces of rock candy. The weather was very cold; but the mercury in my room stood at 60° F., and the tissue, with the addition of the rock candy, was quite pliable, and answered every purpose. When sensitizing Swan's carbon tissue—No. 3 grade, which as a heavier coating of gelatine—the proportion of rock candy may be increased to 6 ounces to 12 ounces of solution. The bubbles can only be prevented by a proper consistency of rubber solution, and being careful to brush the solution with an even-flewing coat. Care should be taken not to get any of the rubber solution on the back of the tissue.

I have also found a sample of paper which gives better satisfaction in my hands than any I have hitherto used for the first transfer. The paper alluded to is that known among paper dealers as "Law Point," weighing 35 pounds to the ream. The desirable qualities of this paper are its absorbent properties, and the heaviness of texture, which makes it invaluable to the carbon printer for transferring the tissue.

I immerse the picture to be developed in a water bath about 80° F. After allowing it to soak for a few minutes, raise the temperature to 90° F.; the tissue in all probability will be ready to transfer. I am greatly in favour of developing in as low a temperature as possible, as it preserves the half tones; when the water is too hot it will invariably cause bubbles.

Insufficient pressure will cause bubbles; this no doubt is the cause of your correspondent's trouble.

I recently received from Mr. Swan some fine tissue, prepared of various colours and of different degrees of strength, to suit the several classes of negatives. The principal shades are black, brown, and purple; these are distinguished by the letters A, B, and C, and the strength by numbers.

No. 1 is suitable for good negatives, but slightly inclining to hardness in those which yield prints with a little too much contrast of light and shade.

No. 2 is adapted for all good negatives having the following qualities, viz.:—The average degree of density, and delicate

gradation in the half tones; and also those which are very clear in the deep shades.

No. 3 suits negatives which give prints with abundant half tones, but somewhat deficient in vigor. The size of the sheets is 18 by 23.

I cannot but admire the highly creditable manner in which Mr. Swan has put his tissue in the market; and I would beg leave to suggest to him, when preparing carbon tissue for this climate, that he make it more pliable; for it is so brittle before sensitizing that it cannot be handled unless slightly steamed in order to soften the gelatine; and great care must be observed in so doing, or the gelatine may soften, and discharge the pigment into the bichromate solution.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting and last meeting of the present session was held on the evening of Thursday, June 11th, at the City of London College, Leadenhall Street, the Rev. F. F. STATHAM, M.A., F.G.S., in the chair.

The minutes of a previous meeting were read and confirmed.

MR. WHARTON SIMPSON exhibited some fine cabinet portraits, consisting of large, brilliant vignette heads by Reutlinger. He also called attention to some paper pulp made from deal, and suggested that it might be worth while to ascertain whether it possessed any value in the manufacture of pyroxaline.

The Secretary then read the report as follows:—

ANNUAL REPORT OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY, 1868.

YOUR Committee, in submitting their Annual Report of the proceedings of the Society for the session 1867-68, beg to congratulate the members on the renewed vitality which the record of the past session so fully evidences.

From circumstances which were under discussion towards the close of the last session, it might have been inferred that the interest hitherto felt by members of the S. L. P. Society would possibly become lukewarm, and thereby endanger its success. Actual events have, on the contrary, shown that the same spirit which has always pervaded this Society is still embodied in a "healthy pulsation;" and your Committee, looking forward to a still higher degree of interest amongst the members, now refer to the proceedings of the Society during the past year.

Your Committee have much pleasure in stating that in the number of papers read there has been an increase compared with the number read last year, and whilst expressing their thanks to those gentlemen who have come forward to read papers, your Committee would still wish to see some fresh recruits to swell the ranks of these members who devote much time and thought to such matters. The following are the names of the gentlemen and the subjects of their papers:—

MR. MEAGHER, on the Breaking of Negatives.

MR. BLANCHARD, on the Preservation of Prints by means of Collodion.

MR. E. COCKING, a Suggestion for Raising the Position of Photographers.

MR. F. HOWARD, on the Introduction of Clouds in Landscape Photography.

MR. J. R. JOHNSON, on Natural Clouds in Landscape Photography.

MR. J. T. TAYLOR, on the Oxyhydrogen Light, and means of Avoiding Explosions.

MR. S. FRY, Omnium Gatherum.

MR. PEARCE, a few Thoughts concerning Portrait Photography.

Your Committee also have much satisfaction in alluding to a novelty in the history of the Society, and which has met with great success, viz., the introduction of a "Question Box," which, on the occasion of using its contents, proved to be one of the most interesting meetings of the session.

The experiment of an exhibition of photographs amongst the members, with conversation thereon, also proved to be a step in the right direction, and your Committee anticipate that on the next similar occasion the result will be still greater in importance.

The Committee are indebted to the following gentlemen for interesting specimens, photographs, and other matters; viz.:—MR. G. WHARTON SIMPSON, MR. BLANCHARD, MR. H. COOPER, MR.

Meagher, Mr. J. T. Taylor, Mr. Nash, Mr. Leake, Mr. T. Sebastian Davis, Mr. J. K. Johnson, Mr. Booty, Mr. Dallmeyer, Mr. Hunter, Mr. Werge, Mr. Henderson, Mr. Rejlander, Mr. E. Cocking.

Your Committee have another source of satisfaction in having obtained for the presentation prints for this session specimens of such well known art photographers as Messrs. Rejlander and H. P. Robinson: from the former, a photograph in silver, entitled "Homeless," and from the latter a large photograph in carbon entitled "Going to Market."

Your Committee desire to thank Messrs. Elliott and Werge for allowing the Committee to hold their meetings at their warehouses.

In conclusion, your Committee hope that, as hinted in last year's report, the possibility of shadows occurring having passed away, the future of the Society may be all sunshine and success.

The Treasurer's account was then read, and showed a balance in hand of £4 3s. 7d.

The Officers for the ensuing year were then elected as follows:—

President: The Rev. F. F. Statham, M.A., F.G.S.

Vice-Presidents: Mr. T. Sebastian Davis, Mr. G. Wharton Simpson, and Mr. V. Blanchard.

Committee: Messrs. Bedford, Bockett, Elliott, Hart, Johnson, Pearce, Werge, and J. T. Taylor.

Treasurer: N. Edgar Fitch, Gwydyr Villa, St. John's Road, Brixton.

Honorary Secretary: Edwin Cocking, Queen's Road, Peckham.

After votes of thanks to the President, Treasurer, and Secretary, for their valuable services during the year,

Mr. CHARLES E. PEARCE read a paper on Portraiture, (see p. 292).

The CHAIRMAN, in proposing a vote of thanks to Mr. Pearce for his able and interesting paper, referred to a recent article in *Cassell's Magazine* on photographic portraiture, in which the prevalence of a "put on" expression in photographic portraits was regretted. He thought that, to avoid this dazed, solemn, and unusual expression was well worthy of consideration. Sometimes it was true that by skill or good fortune a photographic portrait was obtained without it, but the opposite was the rule. Possibly if instantaneous effects could be produced it would be better. He thought it a pity, too, that something more was not attempted in backgrounds: such as the introduction of natural objects as accessories instead of the common stock appliances of curtain, column, balustrade, table, and chair.

Mr. DAVIS said that Mr. Wharton Simpson had, at a recent meeting, exhibited some charming examples of portraiture with natural backgrounds.

The CHAIRMAN also thought that it would be possible for the photographer to keep in his studio some articles of drapery by which he might modify the dress of the sitter. He referred to the portraits of Gainsborough and Reynolds, in which the sitters were often represented in character, so as to communicate pictorial interest to the portrait, independent of its likeness.

Mr. WHARTON SIMPSON exceedingly regretted that he had not known that the subject would be brought before them, otherwise he would have brought with him various examples of the class of work to which the Chairman had referred: portraits with natural backgrounds, and portraits which, without being theatrical, or without attempting strained or unreal characters, were so treated as to give them pictorial value apart from mere portraiture. The cards by Mr. Edge were known to many, and some of Mr. Robinson's recent cabinet pictures would have admirably illustrated what the Chairman had described. It was, however, impossible to get natural effects to any extent without double printing; whilst, however, the variety of effect which natural backgrounds gave was valuable, it should be borne in mind that with few and simple accessories very valuable background effects were possible. M. Salomon—who had, perhaps, more than any other photographer shown the effect of the background in giving value to the head—confined himself to a few of the simplest and most common-place accessories. He showed that in the mode of using them, rather than the objects themselves, all the importance of the subject rested.

Mr. BLANCHARD asked Mr. Pearce if he had brought some of his own fine examples with him, referring to some excellent effects in backgrounds produced by using the gloom of a dark-

ened room, seen through an opened door, instead of a screen for the background.

Mr. PEARCE had not brought the examples with him.

Mr. BLANCHARD did not think that very great rapidity in portraiture was desirable. If portraits could be taken quite instantaneously it would be very well; but as that was impossible, he preferred in portraiture an exposure of 15 or 20 seconds to one of 5 seconds, as time was thus allowed for the sitter to get over the twitching or rigidity of the first few moments of sitting. He thought, too, that a quiet sober, expression was better than a simper or a smile.

The CHAIRMAN complained of a want of intelligence or interest in the expression of so many. He thought the practice of asking the sitter to look at a definite point like a nob was injurious. What interest could a sitter have in his countenance when told to look at a nob?

Mr. BLANCHARD would not ask him to look at a nob; nor was that, he thought, the practice of skilled portraitists. He would prefer to engage the sitter in a conversation which interested him, and then seize the opportunity of exposing when a satisfactory expression was on the face.

Some desultory conversation on the subject followed.

Mr. HOWARD said, that in the earlier days of photography, stiff expression and want of character were common enough. A photographer seeing his sitter for the first time, and taking the portrait at once, could scarcely be expected to do it much justice; but now sitters as well as photographers were getting more educated in regard to photographic portraiture, and he thought that a large class would willingly pay more for better work. He thought that if the sitter had an interview with the photographer previous to the sitting, so that the latter might have time to make up his mind as to the best mode of treatment, superior results would often be secured. Of course, higher charges would have to be made; but the result would be worth the cost, and many would be glad to pay the higher rate for the superior portrait. Of course, unless the sitter aided the photographer by properly entering into the spirit of the thing, very good results could scarcely be expected. He believed that by judicious double printing much better pictorial effects in background could be secured.

Mr. BLANCHARD said that his dark room window was arranged so that he could, unseen, study the sitter; and he found a great advantage in the arrangement.

Mr. DAVIS said he thought it was a great mistake for high class photographers ever to take sitters under any but the most favorable circumstances. If they would only do this, and never send out any but really first-class work, the public would learn that photography was something more than a merely mechanical art. Unfortunately, the ablest men would sometimes send out bad work, and so people lost faith in them. He believed that many of the public would gladly pay high prices if they could be certain of receiving first class work.

Some general conversation followed, in which the CHAIRMAN again referred to the introduction of a variety of natural objects, such, for instance, as were found in many Dutch paintings, those of Gerard Dow, for instance.

Mr. SIMPSON said that there were two serious difficulties in the way of doing this. First, the multiplicity of accessories which would be necessary to avoid uniformity of result, inasmuch as the photographer could only introduce such objects as he could place absolutely before his camera; and secondly, that by photography, the accessories placed in different planes could not be produced in focus. The only mode of effecting the object would be to use double printing. A few well selected background negatives might be made to produce a variety of effects by using different parts of the plate with different figures.

Mr. BLANCHARD deprecated the use of a multiplicity of objects in portraiture, and quoted an apothegm by Mr. Cherrill from the *Year-Book of Photography*, to the effect that as photographs are always elaborate in finish, the subjects of photography should always be simple in design.

After some further conversation on the subject,

Mr. PEARCE agreed, at the suggestion of the President, to provide a paper on the subject of double printing in portraiture for next session. Mr. Blanchard also promised a paper for next session.

After some discussion on the subject of out-door meetings, it was agreed that a meeting should be held on the first Saturday in September, at Hampton Court, the members meeting at "The Mitre" Hotel, at 5 p.m.

The PRESIDENT invited the members to spend an evening with him at his residence on the first Saturday in July. —
The proceedings then terminated.

Correspondence.

INTENSIFYING NEGATIVES—NEUTRAL TONING BATH.

SIR,—Seeing an account in a late number of your Journal that forcibly drying negatives increases their density, I beg to say I have long used the plan of drying the negative before fixing, either by standing it up to dry by itself, or otherwise. The density is most decidedly increased, which is easily proved by letting one-half of the plate dry, and then fix and dry as usual. It will be seen that the part dried before removing the iodide is much darker than the part fixed in the moist state. I use cyanide for fixing.

Mr. W. Bartholomew asks you whether magnesia is much used in the toning bath? I beg to say I have tried it, and found it do very well, but not any different from the prepared chalk bath I described in this Journal two or three years since, and you repeated in the following YEAR-BOOK. It suits any gold. If mixed in the morning, it is ready in the evening. In frosty weather, it is better mixed the night previous. It will keep for days at least, and can be used over and over again, adding more gold, and perhaps, also, more chalk, if there should be no excess of that substance remaining from the previous mixing. An excess is not of the slightest consequence, and it is scarcely possible to have too little, so small is the quantity required. No weighing is necessary. I cannot see any difference in the tones obtaining between chalk and the other formula, and believe it is purely imaginary. My bath is always in order, and the simplest possible. T. S. REEVES.

APPROXIMATE NATURAL COLOURS IN PHOTOGRAPHY.

SIR,—As this desideratum is now receiving much attention, the following may be worthy of a place in your Journal. I have many times, in my out-door practice, obtained landscapes in natural colours by the following manner:—Expose a little longer than required for a negative; develop with the pyrogallic developer, and stop the developing when the picture has arrived at the stage of a positive; wash, and fix with a strong solution of cyanide of potassium; and you will find the sky blue, the road-way a yellow tint, and the trees of a green tinge. I have done some remarkable pictures, but the colours being bad, I have not followed it up with experiments, having so little time on my hands; but it is worthy of attention.—I am, yours, &c., C. KENIG.

450, Edgware Road, June 10th, 1868.

Talk in the Studio.

PHOTOGRAPHY MADE CHEAP AND EASY.—We were struck on passing along a public thoroughfare in the City a few days ago, by an announcement in a stationer's shop window, "Complete photographic apparatus, with material for fifty pictures, for sixpence." We at once invested the sum in question, and, on opening the packet supplied, found that we had received a quarter-plate piece of glass and a piece of cardboard the same size (the two being held together by a couple of india-rubber rings), and a paper containing something less than a drachm of bichromate of potash in powder. A paper of instructions directed the photographic tyro to make a solution of the salt, float writing paper thereon, and then produce a negative by placing the prepared paper in contact with an ordinary print, pressing the print and sensitive paper together between the glass and card, and duly exposing to light. From the negative so obtained any number of prints might be produced on the prepared paper, the only fixing necessary being soaking in warm water. The picture produced was an image, of course, of brown oxide of chromium.

PERMANENT PHOTOGRAPHS.—A recent number of a very ably conducted critical and satirical journal, entitled *The Censor*, in the course of an interesting and kindly notice of Mr. Wharton Simpson's work on the carbon process, has the following remarks:—"But will it wash?" was the question with which Mrs. Siddons startled the draper. A modification of this enquiry we have all addressed to the smiling photographer as he has emerged from the little dark room with a serene self-satisfaction in having achieved a beautiful negative. 'But will it stand?' we have all demanded, and have all received the comforting assurance, given with more or less confidence, that under favorable circumstances it would stand, though its permanence could not be guaranteed. With this assurance we have perforce been content. And then we all know what has happened. After a year or two, signs of distress have appeared in the charming likeness. My lady has, to all appearances, taken to patches, if indeed those black spots do not indicate some cutaneous eruption. As for Sir John, he is dismayed to find himself the centre of a new planetary system, beams of light radiating from his head, as if he were another Phœbus, while comets and uncertain fudicrous nebule, are developing all over and around him. This is not pleasant. Nobody cares for a photographic apotheosis in this kind; and to go down to posterity all blurs and scars, smudges and eruptions, is something terrible to contemplate. Thank heaven, we have now changed all this! Swan's process has reformed it all together."

PHOTOGRAPHIC EVIDENCE.—In the course of the recent action for libel by Risk Allah against the *Daily Telegraph*, photographs of various documents were admitted as evidence.

POISONING WITH BICHROMATE OF POTASH.—Most photographers are aware that this substance is a dangerous poison, but it may be well to remind them, as accidental poisonings have more than once recently occurred. On Monday an inquest was held at Cheltenham on the body of Mr. T. B. Gilling, an auctioneer, who had died from drinking a quantity of bichromate of potash. Deceased had sent for a bottle of Bass's pale ale, which bore the usual label; but, not wishing to drink it at the moment, it was placed beside a number of other bottles in a carpenter's shop. Amongst these was one containing bichromate of potash, which had been put into an empty ale bottle, with the label carelessly left on. The similarity in the appearance of the bottles led to the fatal mistake.

MR. WOODBURY'S PATENT.—We noticed some weeks ago an error in our able contemporary, the *Art Journal*, in relation to the origin of the photo-relief printing process. The number for this month has the following handsome *amende*:—"Disderi's Patent. Under this title appeared, in our April number, a notice of a photographic process which was stated to be one 'based on the invention of Mr. Walter Woodbury.' The PHOTOGRAPHIC NEWS states, and Mr. Woodbury himself has also informed us, that the process is entirely his own invention, and that he somewhat recently sold the patent to a company, of which Mr. Disderi is managing director. Mr. Woodbury has long been known among photographers as one of the most skilful and scientific practitioners of the art, and we are glad to render him the justice that is his due."

SOLAR HEAT AS A MOTOR.—The *Scientific American* says:—"It has been proposed to employ solar heat in generating steam. By using a lens of small diameter, the sun's rays have been concentrated in a vessel containing water to such a degree that enough steam has been generated to drive a small engine. Increasing the size of the lens will, he contends, have the effect of still further intensifying the solar heat, and the power that may be obtained is only to be limited by the dimensions of apparatus employed. Should the plan of this engineer be generally adopted, the old proverbial injunction for promptness will take a mechanical turn—'Make steam while the sun shines,'—instead of its original agricultural significance."

THE SOLAR ECLIPSE.—It is expected that many photographic records will be made of the eclipse of August 18th. The phenomenon of a total obscuration is of rare occurrence, and as it can be observed to advantage in India, the astronomers will not allow this opportunity for making several interesting and valuable observations to pass disregarded. The Indian Government has made great preparations for obtaining a photographic record of the phenomena presented during the eclipse, and the time of its duration—over six minutes—will be long enough to take a large number of negatives, so that much information respecting the physical constitution of the sun may be obtained.

To Correspondents.

G. B. writes as follows:—"I address you on a subject which is to me of considerable importance; and without taking up room with preliminary remarks, I at once enter on it. I have for a number of years been engaged professionally in photography with considerable success. I have had many visitors to my studio, and my work has given general satisfaction. It has been said, however, 'that there is a skeleton in every house.' I am not without one, albeit the skeleton that troubles me takes the form of noxious vapours. Some months ago, a person in possession of the garden next to mine (in which I have my studio) commenced the trade of a butcher. The offal and blood from the slaughtered sheep (from ten to fifteen weekly) he puts into his garden, covering it slightly with earth. For the last six weeks he has put it all on a narrow strip of ground, running parallel to my studio, and within six yards of it. Since the hot weather commenced the smell is intolerable. I find my chemicals have not been working so well lately; this I attribute to these vapours. Would you, Sir, oblige me by stating in your next paper what effect this impure state of the atmosphere is likely to have on the chemicals we work with." Decomposing animal matter will produce ammoniacal and other fumes, decidedly injurious to perfect photographic action. Your proper course is to apply to the officer of health or inspector of nuisances, or other authority, according to the constitution of the local government under which you live. Such a nuisance as you describe, if satisfactorily proved to exist, will doubtless be put promptly down.

SILEX.—The Wothlytype process was attended by more uncertainty and difficulty than the albuminized paper process, and hence never came into extensive use, although it had some undoubted advantages. 2. We believe that the patent was suffered to lapse. 3. We believe that our collodio-chloride process has all the advantages of the Wothlytype process without its uncertainties. 4. We cannot direct you where to purchase pyroxyline for any purpose. It is a difficult thing to purchase good. You can only acquire certainty by trying a sample, and then purchasing a quantity if necessary. Thanks for your remarks on collodion varnishes and carbon. We shall make use of them.

X. W.—In working the morphine process, and using iron development, it is important to add a few drops of nitrate of silver solution to the iron developer before applying it to the plate. If you apply the iron solution without silver the latent image is partially destroyed by the acid present; but this does not occur if the silver solution is added to the iron solution before applying it to the plate. Try again, bearing this in mind, and let us know the result.

W. J. A. G.—The sample of protosulphate of iron you enclose is a little oxidized, but it is not seriously injured. Make your developer as usual, and after adding the acetic acid and shaking for some time, filter before using, to remove any turbidity which may remain. You will find that the developer will give you a little more intensity and cleanness in the shadows than one made from a perfectly pure and clean sample of the iron salt. The black pyrogallie acid is worthless; return it without attempting to use it. The citric acid may possibly be all right. The carbonate of ammonia without smell will scarcely be good; that you can get fresh of a local chemist. The only explanation we can offer is that you have ordered them of some one having very little sale for such things, who has supplied you with articles long in stock, and spoiled by age and careless preservation.

G. NICHOLSON.—The only catalogue of stereoscopic pictures, besides those you mention, which we remember, are those of Mr. Blanchard, of 12, Camden Cottages, N.W., and Mr. England, Notting Hill Square.

MANTON.—The defect in your print is not *measles*, but *meatiness*. The former is the result of imperfect fixation, and is manifested in mottled yellow spots in the texture of the paper. *Meatiness* consists of a somewhat irregular, granular effect in toning, due to a variety of causes. It is at times due to nitric acid in the printing bath; at times to the use of a new toning bath not sufficiently ripe; at times to the use of carbonate of soda in the toning bath, which we never recommend; at times, and very commonly, to the use of a weak negative, which does not permit sufficient reduction of silver to form rich blacks before the lights are over-printed. Use your printing bath quite neutral; avoid carbonate of soda in your toning bath; and do not use the bath too new or too strong. Above all, use negatives sufficiently vigorous. We see no reason to believe that the paper is in fault; but we do not know the maker. We are glad to learn that professional photography is improving in a business sense in your neighbourhood.

INQUIRER.—No apology was necessary for making the enquiry, although, as you remark, the matter is not of sufficient interest for public discussion. The leading fact in the statement to which you refer is true; the minor statements given in the way of comment and explanation are quite untrue. Discourtesy is a matter of taste upon which every one can form his own opinion. Truth or untruth is a matter of fact, and remains unaffected by assertion or

opinion. The attention of the committee was called to the matter by an outside member, who pointed out that if such untruthful and discourteous reports were permitted, no matter how unimportant the authority or how limited the audience, it must tend to check the freedom of discussion and social intercourse which had distinguished the proceedings of the society. The fact that a meeting of the committee unanimously adopted such a resolution under the circumstances affords tolerably satisfactory assurance of the propriety of the step. The statement that the matter was due to our action at all is, it is scarcely necessary to say, untrue. The report you have heard as to the cause of withdrawal is quite true; but we do not agree with you as to the propriety of publishing it. We do not care to brand a man publicly with his private faults or misfortunes unless he insist on the disclosure.

J. C. B.—See article in the present number.

MORPHINE.—The solution of acetate of morphine can be used over and over again as a rule; but of course it suffers gradual deterioration by dilution with the water on the plate. Your loss of sensitiveness is doubtless due to the exhaustion of the strength of the morphine solution, which, you must remember, is very weak, even at the outset. Beaufoy's acetic acid is intended. We are glad that you profit by the articles on Pictorial Effect.

Z.—It is possible to estimate the amount of chloride of gold in a solution, but not by specific gravity with an instrument like the argentometer. Such a method would not be sufficiently delicate, and would not distinguish between the presence of pure chloride and the double chlorides of gold and various alkaline metals. The most delicate test is oxalic acid, precipitating the gold from a measured quantity of solution by means of a standard solution of oxalic acid. The process requires care and familiarity with such manipulations. We have not space to enter into details in this column, but we shall probably take an early occasion of disclosing the method in question. 2. You complicate the operations and waste permanganate of potash if you add it to a bath containing free nitric acid, which will at once decompose the permanganate.

A CONSTANT READER.—Mr. Spiller found that the example of nitrate of silver recommended by Mr. McLachlan was really pure neutral nitrate of silver discoloured on the outside, probably by contact with the vapours of chlorine. Any pure sample of nitrate of silver will serve.

F. M. P. wishes for information as to the manufacture of a portable glass house, which can be packed into comparatively small compass, and which shall not be very costly. We fear that the data are too indefinite to enable us to help him much. Can any of our readers give any hints?

SUBSCRIBER.—You could at any time obtain information by writing to a member of the committee; but the matter is of too limited interest to occupy our pages by frequent explanations. We announced some time ago that the balance would be returned to the subscribers *pro rata*; no other intention has ever been entertained. The delay in doing this has been owing to causes beyond the control of the committee, but will probably be effected shortly. The matter concerns the two or three hundred subscribers, all, or the majority, of whom trust the committee. It does not concern the meddlesome persons you name.

G. ROBERT FITT.—The exposures you describe are undoubtedly enormously long, four or five times too long, at least. The example of the work which you forward is very fine indeed, and shows that the quality and character of the lighting are good; but it is quite clear that, from some cause, the exposures are much too long. Ten seconds for a card picture, with a good lens and aperture small enough for covering, is the outside exposure we should think necessary. We do not see anything in the quality of the glass, on a cursory examination, which can justify the long exposure, but will examine further. So far as we can suggest at present, the cause may be in having too much of the top-light obscured. As the season has advanced the sun has become more vertical, and as you obstruct almost all vertical light you have gained nothing in rapidity with the advance of the season. We will give the matter attention, and add more another week if anything strikes us.

BLACKHEATH.—The dirty yellow colour produced by adding permanganate of potash to rain-water is caused by the oxide of manganese formed by the decomposition. It will gradually precipitate. To be certain that all organic matter has been oxidized, add the permanganate until a faint permanent pink tint is produced in the water. Rain-water so treated will be fit for making a silver bath. 2. Permanganate of silver added to water containing chlorides ought to have thrown down a precipitate of chloride of silver. We cannot explain its failure to do so. It is not necessary to the reaction that the water should have been rendered alkaline. The safest mode of purifying the water in question is to add a few grains of nitrate of silver and expose for a few days to sunlight. This will throw down both chlorides and organic matter. 3. There is an undoubted difference between the results in the tannin and coffee processes; but a resemblance in the processes so far as the active principle of coffee resembles tannin.

W. T. B.—We do not, unfortunately, remember the address of the society in question, but will try to ascertain. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 512.—June 26, 1868.

CONTENTS.

	PAGE
Dirty Plates.....	301
Celloid-Chloride for Printing on Ivory	302
Permanent Albuminized Prints.....	302
Keeping and Dating Collodion	302
Pictorial Effect in Photography. By H. P. Robinson.....	303
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey ..	304
Photo-zincography in Practice. By J. Waterhouse, R.A.....	306

	PAGE
Remarks upon the Carbon Process. By Dr. H. Vogel	308
Modified Photographic Pictures.....	309
Printing by Development.....	309
Correspondence—Photographs of the Moon—The Transmission of Actinism by Light—Permanganate in the Nitrate Bath —The Coffee Preservative—Wet Photography in the Field without a Tent—Modes of Toning.....	309
Talk in the Studio	311
To Correspondents.....	312

DIRTY PLATES.

PERHAPS few troubles are more mortifying to the photographer than those arising from dirty glasses, a mortification which is much intensified if a few good new glasses to fall back upon are not in stock, or readily procurable. We recently spent some hours in the studio of a first-class photographer in the provinces, who had suffered seriously from the trouble in question, and witnessed its operation under more than usually irritating circumstances. A stock of patent plate had been ordered and received from a reputable London house. On trying the glass, however, it was found impossible by any mode of cleaning the plate to obtain a clean negative. The defects were unusual in character, and bath and collodion were at first in turn condemned. Unlike the well-known defects produced by dirty glasses, these consisted in fine, straight, transparent lines, varying from half an inch to 2 inches in length, sometimes vertical, sometimes horizontal. The most careful examination of the glass before producing the negative showed no indication of a defective or imperfectly cleaned surface; but whilst the chemicals were working very well in all other respects, giving rich, vigorous negatives, it was impossible to get rid of these markings.

As it became manifest that the glass was in fault, recourse was had to a stock of old patent plate-glass from which some negatives had been cleaned. This glass had undergone a careful treatment with the bichromate of potash and sulphuric acid mixture recommended by Mr. Carey Lea. But now a new series of troubles arose: the ordinary markings of dirty plates were plentiful. The powerful detergent action of the above preparation was insufficient to remove the traces of former use, and mottled stains of increased opacity were apparent in every instance, chiefly noticeable in plain backgrounds, where stains are fatal to the character of a picture. Other modes of cleaning were tried, employing strong acids, and strong alkalis, tripoli, &c.; but in no case was perfect immunity from stains secured on the old glasses.

In the meantime a new stock of patent plate had been ordered from another house, and after a hasty cleaning a plate was tried, and a perfectly stainless negative was the result. We saw half-a-dozen negatives tried with plates taken at random from each group of glasses. The first in every instance gave the straight lines first described; the old glasses invariably gave mottled stains; and the new lot of patent plate invariably gave perfectly clean negatives.

The only conclusion to which we could come regarding the first examples of the patent plate giving the fine lines was that it was imperfectly polished in the manufacture, and that little grooves existed in the surface too fine for observation, but in which lodged some trace of the cleaning or polishing material, which, lurking there, was inimical to photographic action, and so caused the transparent lines. Dealers and pho-

tographers alike should be on their guard against such a sample of glass; but not knowing its history we can only offer a vague caution. It was a little cheaper than the sample patent plate upon which perfectly cleaned negatives were taken; but the difference in price was not sufficient to account for marked difference in quality.

Regarding the old glasses which had been cleaned, it is to be observed that it is difficult to prescribe a plan of cleaning which shall be certainly efficient in all cases, inasmuch as in some samples of glass the dirt is not merely on the surface, but in combination with it, and can only be removed by the removal of the outer surface of the glass. We have at times had striking illustration of this in opal glass, which, after having been used and carefully cleaned, has, on standing in the light, gradually shown traces of the image which had been in the collodion film long since cleaned from its surface. The silver salts in some cases clearly enter into combination with the glass; the salts of iron also have a special action on the surface, the effects of which are difficult to remove. The best detergent we have used in such circumstances has been nitric acid and water in equal parts, applied with a rubber of woollen cloth or druggist rolled up and tied tight, so as to permit the end of the roller to be used on the glass. This, followed by rotten stone and alcohol, has rarely failed in our hands; but it is possible that it may not be efficient in all cases. Perhaps in the most obstinate cases the use of dilute hydrofluoric acid would be the most certain cure. By the careful application of this dilute acid the first surface of the glass will be removed, leaving another polished surface underneath. The difficulty to be guarded against is the production of an uneven though polished surface, not equal to the perfectly plane surface secured by the mechanical grinding and polishing which patent plate undergoes. In using hydrofluoric acid its exceedingly corrosive action on the skin should always be borne in mind.

An excellent piece of advice in regard to old glasses has at times been given, to the effect that the best treatment to which they can be submitted is to place them under a hammer and destroy them. The cure is certain, but costly. Photographers who are in the habit of using patent plate glass in sizes of 12 by 10 and upwards naturally hesitate before deliberately destroying plates of glass, each of which may have cost two shillings or more. A more economical remedy is therefore desirable.

Happily, under the worst of circumstances, a cheap, simple, and certain remedy is at hand. Dirt was defined by the late Lord Palmerston as "matter in the wrong place." This definition admirably meets the case in point. The matter which is on the dirty glass is in the wrong place emphatically, because it possesses chemical action, and either increases or reduces the amount of silver reduced, and so causes an opaque or transparent mark. If it were quite

inert it would do little harm. The remedy, then, consists of covering over with an inert substance the surface from which we cannot remove the actinic substance. A little pure bees'-wax dissolved in ether and rubbed over the plate has the happy effect of coating the surface with an almost imperceptible film, which is quite inert in itself to photographic action, and effectually interposes a barrier between the collodion film and the chemicals it contains, and the glass surface and the active dirt which rests unseen upon or in combination with it. Whilst no photographer will willingly work with dirty glasses, he possesses in this coating of wax a relief from the immediate annoyance of bad plates when perfect ones are not immediately procurable.

COLLODIO-CHLORIDE FOR PRINTING ON IVORY.

THE enquiries of several recent correspondents as to a simple method of printing on ivory have induced us to repeat some experiments with our collodio-chloride of silver process for that purpose. Mr. Fry published in our pages, a few years ago, a method of silver printing on ivory, excellent in result, but somewhat troublesome in detail. We also published, some years ago, a method of securing good results by means of the Wothlytpe process. But after some experiment in this direction we arrived at the conviction that there is no method of printing upon ivory by which such good results can be obtained with so much ease and certainty as by the collodio-chloride of silver process.

No modification of the formula is required: a sample of collodio-chloride which works well on paper or opal glass will give admirable pictures on ivory. One condition only is of importance: to secure the best results the collodion should not be made of a sample of pyroxyline giving a very horny, repellent film. The sample we have used is such as we should choose for a negative collodion, neither very powdery nor very horny. It adheres perfectly to ivory, giving a hard surface, less easily scratched or abraded than the same film on glass, and the appearance of the image does not differ perceptibly from one on the surface of the ivory itself without collodion intervening.

The prepared ivory is coated with collodio-chloride, and when dry is printed, toned, and fixed in the same manner as a picture on opal glass. The film adheres with sufficient tenacity to render any edging of varnish unnecessary. A more perfect washing to remove the hyposulphite is necessary than with opal glass, because of the more absorbent character of the ivory.

A somewhat unexpected fact may be here noted, which may prove of service to some of your readers who may have in hand the materials for collodio-chloride of silver apparently spoiled. About twelve months ago we received from a correspondent two bottles containing the unmixed collodio-chloride as supplied by a manufacturer, one bottle containing collodion with nitrate of silver in solution, and the other containing collodion with a chloride in solution; the labels instructing that the contents should be mixed in equal parts to form the collodio-chloride. Unfortunately, collodion containing nitrate of silver is subject to decomposition, and that forwarded to us had, after a few months' keeping, turned quite brown, and our correspondent wished to know if it were fit to be used. At the time we condemned it as useless; but, a few weeks ago, in the course of some experiments, we were induced to try the mixture of the contents of two bottles. The result was, of course, a discoloured sample of collodio-chloride of silver; but what was our surprise on examining it again, after it had stood a few hours in the dark, to find that the dark-coloured collodio-chloride had become perfectly milk white! The chlorine liberated in the decomposition had acted on the decomposed, darkened salt of silver, converting it into pure white chloride of silver. This fact may prove as useful to those of our correspondents who have a decomposed sample of the nitrated collodion on hand as it is curious and interesting.

In our next we shall detail the results of some experiments with the paper prepared with collodio-chloride of silver manufactured commercially by Herr Obernetter, which is used considerably, we understand, in Germany.

PERMANENT ALBUMINIZED PRINTS.

Our attention was called a few days ago to some examples of unusual permanence in albuminized prints. Those in question had been printed six years, a period not unusual, of course, for photographs to remain without fading, but, nevertheless, a period at the expiration of which most silver prints have generally lost their first bloom, that especial purity of the whites and rich velvet-like depth in the blacks which are the glories of fine silver prints. The prints in question were printed on a distinct sample of paper, and could each be readily picked out from a number of others printed at the same time on other samples of paper, the distinction being found in the fact that whilst the other prints, without being absolutely faded, had all lost their first freshness and beauty, and were less brilliant in the whites and less rich in the blacks than at first, these seemed wholly unchanged. As all had received the same treatment and were printed at the same time, it became worth while to enquire to what the difference was due.

The only difference consisted in the fact that the permanent prints were printed on a sample of albuminized paper prepared in Germany, which was popular a few years ago, and the use of which at the time we were strongly tempted to condemn as, *a priori*, likely to yield unstable prints. It was manifestly prepared with albumen which had undergone decomposition, and the smell was most offensive. Two questions arise as to this source of permanence: Is it possible, however unlikely, that the use of the decomposed albumen could in any way conduce to increased permanency? or is it more probable that the permanency is due to the special quality of the sample of paper upon which the decomposed albumen rested? The paper was exceedingly thin; so much so that until the prints were mounted on a good white board they looked poor and wanting in brilliancy; and if mounted on a tinted board the whites were somewhat degraded by the tint showing through. The thinner the paper the more easily it is permeated by the fixing and other solutions, and the more easily perfect washing is effected. Possibly, therefore, the extreme thinness of the paper was an element in the stability of the prints. The subject is certainly worth examination; and, at Mr. Blanchard's suggestion, we bring it before our readers, to permit the comparison of notes on the subject. Possibly other photographers may be able to examine prints produced on the same paper, which was at the time somewhat extensively used. It will be interesting to learn if the experience of Mr. Blanchard in this matter is confirmed by that of other photographers.

KEEPING AND DATING COLLODION.

THE advantages of ripe collodion, and the troubles contingent upon the use of samples newly mixed, are too well known amongst photographers to require enforcing. It is not a little singular, however, that it is at times difficult to procure a sample sufficiently ripe to work with desirable vigour and brilliancy. A correspondent recently called our attention to this fact as a ground of complaint against manufacturers of collodion. Having just received a parcel from a first-class manufacturer, whose collodion he had used some time with advantage, he found in the new sample none of the qualities of the old. It gave a thin image, which did not readily intensify, had a tendency to fog, with other concomitant defects of newly-mixed collodion. On complaining to the manufacturer of these defects, he received the somewhat facetious reply that it would work capitally in the course of a couple of years,

We have often urged upon manufacturers the importance of appending to the labels of all samples sent out ready salted the date at which the collodion was mixed. This plan would often afford the photographer data for forming an opinion, without a series of trials, of the probable fitness of each sample for different kinds of work for which it may be required. Failing to secure such advantages as this system of dating would give them, photographers may materially secure their own convenience by purchasing the plain collodion, and either adding the iodizing solution supplied by the manufacturer, or such iodides and bromides as their experience may induce them to select from the various formulæ we have published. A quantity so mixed, dated, and laid down to ripen, say once in six months, would enable the photographer to have a constant supply in uniform condition, instead of being subject to the fluctuations in the age and working qualities of his collodion which must inevitably arise when he must use to-day that which he purchased yesterday from the manufacturer.

PICTORIAL EFFECT IN PHOTOGRAPHY ;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXII.

"By the choice and scenery of a background we are frequently enabled to judge how far a painter entered into his subject, whether he understood its nature, to which class it belonged, what impression it was capable of making, what passion it was calculated to rouse. Sometimes it ought to be negative, entirely subordinate, receding, or shrinking into itself; sometimes, more positive, it acts, invigorates, assists the subject, and claims attention."
—*Fuseli*.

BACKGROUNDS AND ACCESSORIES.

IN portraiture the background, often neglected and considered as but of little moment so that it be clean and smooth, should hold a very important place when the composition and chiaroscuro of the picture is considered. The backgrounds of his portraits was thought to be of so much consequence by Sir Joshua Reynolds that he frequently declared that whatever preparatory assistance he might admit in his draperies or other parts of the figure, he always made it a point to keep the arrangement of the scenery, the disposition and ultimate finish of the background, to himself. The most carefully manipulated portrait, exhibiting the most delicate photography, and the most refined light and shade and composition, may be destroyed, or its beauty much impaired, by an ill-chosen background; or it may be efficiently aided and supported by a proper and suitable arrangement of form and light and shade in this important portion of the picture.

The general practice with most photographers, until lately, has been to employ a perfectly plain, even-tinted background, or badly painted representations of interiors or landscapes; but last year the large collection of pictures by Adam Salomon in the Paris Exhibition convinced photographers of the extreme value of light and shade, gradation and tone, behind the figure, to relieve some parts and to hide others, to give breadth and concentrate attention to the principal feature, the head. Other photographers have known the value of this effect, and have exhibited their results, but never so large and convincing a collection as the one I have mentioned.

In using a plain background, without any variation of light and shade, the photographer throws away a great advantage. Nothing could be more antagonistic to breadth, atmosphere, and richness—nothing could so surely scene a flat, inlaid effect of the figure—than a plain background. It would be difficult to find a surface without gradation in nature. Take the plain surface of the wall of a room as a background, and you will not find it easy to discover a sufficient space for a background on which a shadow modifying its even tint does not fall. The cloudless sky is marvellously graded from the zenith to the horizon; and so you may go throughout all nature till you surprise yourself with the discovery that the only plain, blank thing in this world is a photo-

grapher's background, on which the equal light falls from a broad expanse of glass. Ruskin, in his "Elements of Drawing," has a fine passage on gradation of colour, which is equally applicable to light and shade, and, therefore, to our subject. It is so just that I need not make any apology for introducing it here:—"Whenever you lay on a mass of colour, be sure that however large it may be, or however small, it shall be graduated. No colour exists in nature, under ordinary circumstances, without gradation. If you do not see this it is the fault of your inexperience; you will see it in due time if you practise enough. But in general you may see it at once. In the birch trunk, for instance, the rosy-grey *must* be graduated by the roundness of the stem till it meets the shaded side; similarly, the shaded side is graduated by reflected light. Accordingly, you must, in every tint you lay on, make it a little paler at one part than another, and get an even gradation between the two depths. This is very like laying down a formal law or receipt for you; but you will find it merely the assertion of a natural fact. It is not, indeed, physically impossible to meet with an ungraded piece of colour, but it is so supremely improbable that you had better get into the habit of asking yourself invariably, when you are going to copy a tint, not 'Is that graduated?' but, 'Which way is that graduated?' and at least, in ninety-nine out of a hundred instances, you will be able to answer decisively after a careful glance, though the gradation may have been so subtle that you did not see it at first. And it does not matter how small the touch of colour may be, though not larger than the smallest pin's head, if one part of it is not darker than the rest, it is a bad touch; for it is not merely because the natural fact is so that your colour should be graduated; the preciousness and pleasantness of the colour itself depend more on this than on any other of its qualities, for gradation is to colours just what curvature is to lines, both being felt to be beautiful by the pure instinct of every human mind. * * * What the difference is in mere beauty between a graduated and ungraded colour may be seen easily by laying an even tint of rose-colour on paper, and putting a rose-leaf beside it. The victorious beauty of the rose, as compared with other flowers, depends wholly on the delicacy and quantity of its colour gradations, all other flowers being either less rich in gradations, not having so many folds of leaf, or less tender, being patched and veined instead of flushed." Further on he says:—"You will not, in Turner's largest oil pictures, perhaps 6 or 7 feet long by 4 or 5 high, find one spot of colour as large as a grain of wheat ungraded; and you will find in practice that brilliancy of hue and vigour of light, and even the aspect of transparency in shade, are essentially dependent on this character alone: hardness, coldness, and opacity resulting far more from *equality* of colour than from nature of colour."

It is thus with photographs and pictures in monochrome: an isolated mass of dark is not rich, neither is a separated space of light brilliant; it is opposition and gradation of the one with the other that produces richness and brilliancy. Therefore a plain background is the most destructive to pictorial effect that could be placed behind a figure. A glance at the illustrations to a recent chapter will show that one of the effects of a plain background is to represent the figure as cut out and stuck down on a piece of plain grey paper.

Haydon called the background the most hazardous part of the picture, and a subject that required as much consideration as the figures, because, be the figures ever so good, their effect may be seriously injured by ineffective support. There is a story told of Rubens by which it will be seen that he also considered that to the effect of the picture the background is of the greatest importance.

A young painter being anxious to enter Rubens' studio as a pupil, induced an influential friend to recommend him, who did so by informing the great painter that he was already somewhat advanced in art, and would be of immediate assistance to him in his backgrounds. The great painter, smiling at his friend's simplicity, said, that if the

youth was capable of painting his backgrounds, he stood in no need of further instructions; that the regulation and management of them required the most comprehensive knowledge of art.

It would be impossible to give definite instructions for the management of the background, but the treatment of different artists may be alluded to. The system adopted in most of his pictures by Adam-Salomon, following the plan of many of the most famous portrait painters, appears to be that the lightest side of the figure shall be relieved by dark, and the darkest side by light. The upper corner of the picture, on the side from which the light comes, is intensely dark, which is graduated diagonally across the picture into middle tint behind the head, which is again more abruptly opposed and carried away into dark by the accessories, or is again allowed to die away into shade.* He also appears to appreciate the value of a vertical line in the background to give stability to the composition, usually obtaining it by the straight lines of a fluted column (an objectionable accessory, in my opinion, for reasons which I shall give in the next chapter). There can be no doubt that these pictures of M. Adam-Salomon are the most effective portraits, containing all valuable qualities, that have yet appeared in photography, and afford a most valuable lesson to photographers.

The backgrounds to the portraits of Sir Joshua Reynolds are always worthy of study, whenever they can be seen. Some of his finest and richest pictures have a dark ground, on which the head shines like a jewel; many are relieved in the manner employed by Adam-Salomon; and it is to be noticed that in nearly every picture in which the background is graduated, he has introduced one or two vertical lines to aid the composition, generally a dark line and a light one, a mere suggestion of a pilaster. His landscape backgrounds were always singularly appropriate and natural, although the horizon in many instances is lower than we should feel justified in representing it in such a truthful art as photography. Although his practice was to relieve the dark side of the figure with light, and the light with dark, in his discourses he advocates an opposite treatment, one which is to be found in the work of Coreggio and other painters of his school. In commenting on the precept of Leonardo da Vinci, that the shadowed side of the figure should be relieved by light, Sir Joshua says:—"If Leonardo had lived to see the superior splendour and effect which has been since produced by the exactly contrary conduct—by joining light to light and shadow to shadow—though without doubt he would have admired it, yet, as it ought not, so probably it would not, be the first rule with which he would have begun his instructions."

On whichever principle the photographer arranges his background, he must remember that it should relieve the figure, and not produce an inlaid effect, and that it should present with the figure an agreeable breadth of light and shade.

When will background manufacturers supply graduated screens? They all tell you that it is impossible to produce them. This I know to be an error. They are difficult to paint, but I know from actual experience that the thing can be done. If photographers would insist upon having what they wanted, they would get it. They should not be content to use anything with which the manufacturers choose to supply them.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.

TONING BATHS AND TONING DIFFICULTIES, ETC.†

THEN, by what means do the toning methods usually employed perform the desired work? Chlorine having an affinity for the alkaline base known as sodium, such base, in connection with some acid, is employed.

First, carbonate of soda demands attention.

When chloride of gold was first introduced into photography as a toning agent for silver prints, it was employed in connection with hyposulphite of soda. Of that form of toning bath I shall have more to say anon; at present I need only remark that certain defects caused the hypo bath to be almost generally discarded in favour of the alkaline toning solution devised by Mr. Waterhouse. In the absence of direct evidence, I must only surmise that the use of carbonate of soda was suggested in this wise. It was found that a silver print immersed in a solution of chloride of gold mixed with a moderate quantity of water was immediately rendered unsightly by the over-active chlorine, and free acid was suspected of evil doing. To curb the acid, carbonate of soda was introduced, when it was perceived that the action became more steady and regular, and pleasing tones resulted. Hence it was put down as a matter of certainty that to secure good tones the solution must be in a decidedly alkaline condition. Unlucky decision!—false, yet not unreasonable—drawn in days of inexperience. And bitter have proved the fruits of that unfortunate concoction of gold and alkalinity so imported.

To collect clear water from a mud-stained stream the taint must needs be removed by some process of filtration. In like manner, by the exercise of reasoning, I shall endeavour to filter out the obscurity connected with the unsatisfactory soda methods of toning, and lay bare the principles which need only be clearly understood to make toning difficulties a thing of the past. From the fact of a concentrated chloride of gold solution (without an alkaline adjunct) proving too powerful for toning purposes we learn that the silver print exercises a disturbing influence which decomposes the gold combination when the print is exposed to its power; in other words, the prints, when immersed in a gold bath, attract and separate chlorine. By observing this fact we rid ourselves of the erroneous yet prevailing notion that carbonate of soda has anything to do with setting up toning action. The part played by the alkaline adjunct is clearly a retarding, not an initiating or accelerating, influence. Accept this argument, and I proceed to argue the whole matter in plainer detail.

The chloride of gold of commerce consists of gold in combination with chlorine and free acid. In that state it is supposed to be quite unsuited for toning purposes; recourse is therefore had to (first) carbonate of soda. When this alkaline substance is added to the gold, the free acid is neutralised, and chloride of sodium is formed, whilst carbonic acid is set free. Now if the quantity of the carbonate of soda added is so nicely adjusted as to destroy the free acid and leave no excess of soda, we have a carbonate of soda bath in its best form, so that on introducing the silver prints into the solution they directly withdraw the chlorine from the gold, and the metal is deposited on the surface of the paper.

But "prints so treated turn up bleached and fearfully mealy," suggests experience. Granted; but the solutions misguided experience has been from the first in the habit of using are too concentrated—too strong by many degrees. Dilution would remedy the evil. "Then why not do away with soda altogether, and destroy the evil tendencies of the acid as well, by drowning it with a still greater supply of water?" Just what I am aiming after. We shall succeed, doubtless, by-and-by; at present I have to show the result of decided alkalinity, produced by an excessive quantity of carbonate of soda. When a quantity of soda is added to a gold solution above that requisite for neutralizing the free acid, a second force is introduced, which battles for precedence with the attraction exerted by the silver surfaces of the paper. Silver has a desire to embrace the chlorine; so has the soda, which, however, enjoys a better chance by prior combination, as the soda must be added to the toning bath before the prints can be admitted. Between these opposing forces a kind of equilibrium is for some time preserved, until soda finally gains the day, and

* An admirable and lucid description of the studio arrangements by which this effect is obtained appeared in the account of M. Salomon's studio, by the Editor, in the PHOTOGRAPHIC NEWS, January 24, 1868.

† Continued from p. 292.

the bottom of the dish enjoys the precipitate of gold intended for the beautifying of the prints. Condensing these arguments into their narrowest compass, we learn—

1st. That alkalinity is an error that should give place to a more comprehensive and practical measure—which may be understood as a neutral condition.

2nd. That as two samples of chloride of gold rarely contain the same amount of free acid, any strict formula is altogether an error on which no reliance should be placed.

3rd. Seeing that a strictly neutral bath is a difficult thing to manufacture, any method that would enable the gold to be employed without the uncertain aid of an alkaline adjunct would prove a boon to photographers generally. To a feeble extent this want is provided by acetate of soda, to which substance I now direct attention.

Acetate of soda, as is pretty generally known, possesses the same kind of base as the carbonate of soda; but instead of the unstable carbonic acid, it is combined with the stronger acid from which it takes its name. That the more stable acetic acid cannot be so easily dislodged as the carbonic acid is made self-evident; that such is a practical fact is proved by the behaviour of an acetate toning bath. All who have had occasion to use the acetate bath must have observed that, when newly prepared, the action of the chlorine is as violent as a gold solution without any restraining adjunct. That goes to prove the argument I adopt; viz., that decomposition, which occurs in the acetate bath, does not commence at once if the acetate of soda is pure, but requires time to enable the chlorine to dislodge the acetic acid, also for the free acid to be neutralized; hence the reason why it is recommended that an acetate bath be kept a few days previous to its being employed for toning purposes. The principles of the acetate bath, as far as theory goes, are correct; but in practice, the elements of uncertainty are found to prevail; oftentimes, in lieu of the gold being preserved in a fit state for toning, it is found precipitated at the bottom of the bottle. The premature decomposition referred to I have discovered is often occasioned by carbonate of soda being present in considerable quantity with the acetate of soda, but under the most favourable circumstances, I am inclined to think that a toning bath of any description, which needs the ripening process of keeping, must prove more or less uncertain in its working qualities. It is advised, that when the bath of which we are speaking is found to be inert, a little fresh chloride of gold should be added, which, by the catalytical action it possesses, causes the gold rendered inactive to be restored to toning vitality. I have directed much attention to this point, and am of the opinion that the only gold precipitated on the print is the quantity freshly added, as I have invariably found that the toning action is stopped, after a brief interval, as suddenly as it commenced. Once more indulging in a brief summary, we may reckon up the acetate bath as follows:—

1st. An acetate bath is unfit for use when freshly prepared.

2nd. The keeping requisite to rob the gold of its bleaching power, though theoretically correct, proves in practice uncertain, and frequently the results obtained are unsatisfactory.

3rd. As the acetate of soda of commerce is found to vary in purity, this of itself is reason sufficient that a toning solution yielding precisely similar tones without any uncertainty about it would be the *summum bonum* of a photographer's aspirations in the direction of silver printing.

4th. Whether pure or impure, the acetate and gold combination has proved the greatest enemy to the paper albuminizers, whose preparations are, as a rule, accredited with all the defects which must attend the use of toning solutions whose constitution is, after all, of a decidedly empirical character.

Much has been said and written concerning the admirable tones produced by an acetate bath, and the virtue is supposed in some way to arise from the acetate of soda. The facts, however, are widely at variance with the supposition, as we shall endeavour to show in another brief summary. The tone of a picture depends,

1st. On the amount of reduced silver that forms the ground work.

2nd. On the integrity of the ground work being preserved from the reducing influence of liberated chlorine.

3rd. The tone produced by the toning solution must depend—1st, on the colour of the basement; 2nd, on the amount of gold precipitated.

This last division points out the nature of the excellencies attributed to the acetate bath, which makes it a popular and fashionable photographic agent, adopted, as a rule, in preference to any other form of toning solution. It must have been observed that a brilliant tone is only of occasional attainment with any kind of toning bath now in use. A brief study of the subject will expose the reason why. I have endeavoured to show the results obtained from an acetate bath in the two extremes of conditions, viz., in the onset, over-activity; in a prolonged keeping stage, inertness. Now it will be noticed that an acetate bath prepared with suitable materials must be in the best working condition when it approaches the intermediate stage; neither too fast nor too slow. When used in this state of happy medium (difficult to attain and know the exact moment) the gold is precipitated in a fine state of subdivision. The stratum of silver is not reduced, and its warm colour gives life to the tone produced by the deposit of gold.

Were it possible to concoct such a satisfactory acetate bath at will, I had been saved the labour attending the preparation of this article. Its not being so will perhaps induce photographers to overlook the simplicity of the bath I have devised, and now proceed to explain—first asking exemption from the task of examining the phosphate of soda, the tungstate of soda, magnesia, and other toning baths of the same nature, as the main points I have dwelt on are precisely similar to the principles I have traced in each of the solutions last referred to. The hypo and sulphocyanide toning solutions are, however, exceptions. First, they waste any amount of gold; second, they yield a tone quite different from the ordinary tones derived from a precipitate of gold; the modification I regard as no permanent advantage, as I believe it to arise from sulphur deposit, not from any change in the precipitate of gold. Let the case rest as it may; uncertainty is also the characteristic of the solutions last named. Mix it as you may; make it even more empirical than the absurdly constructed formulæ which have of late been highly recommended, it will prove a sorry servant; so my advice is, do not try it. I will now to my method, the excellence of the results of which, I can assure the reader, is equal to the simplicity.

Use the orange coloured sample of gold, which is a double salt, consisting of chloride of gold and sodium; pay special attention to this, or do not blame me on account of your failures.

Keep your gold in concentrated solution.

Chloride of gold	...	...	...	1 grain
Water	...	...	...	1 drachm

I have already shown that gold requires no acceleration; the adjuncts employed serve as retarders. Then, in lieu of employing uncertain alkaline agents, we make use of the more stable substance known as water. When a physician desires to administer an active poison as a medicine to his patient, he adopts an infinitesimal quantity of the poison, which he rids of its destroying properties by diffusing it through a comparatively large body of water; I embrace a similar principle in the construction of my toning bath, which I prepare as follows:—

1st. Measure out 2 gallons of water (rain or river water if at hand; well water should be previously boiled).

2nd. Measure into a jug (porcelain) 12 grains of gold, add about 1 grain of fine table salt, and pour over the whole $1\frac{1}{2}$ pints of boiling water; allow this to stand awhile, until lukewarm; then add to the 2 gallons of water previously measured out. Your bath is made, and ready for use. Go to work.

How ridiculously simple! Never can work. Now if there was only an addition of some substance that costs a guinea a grain, it might answer; but as it stands—pshaw!

Stop, friend; I have not explained all the wonders connected with this—in my hands—unerring toning solution.

1st. It improves with age. It must after each day's work be returned to a jar, and strengthened always before use by adding gold and a minute trace of salt treated with boiling water as at first. The quantity of gold required is, however, widely different.

To keep at working strength, measure out 4 grains of gold, add a minute trace of fine salt, pour over it about half a pint of boiling water; allow it to stand a bit, add the gold mixture thus prepared to the toning bath, and if you have a batch of ten, twenty, or thirty sheets, place the prints quickly, one by one and face downwards, into the solution. Tonic all at one time, remember. Do not hurry yourself; the toning will be regular, and the tones should turn out satisfactorily.

To preserve the solution in good condition I add daily about a pint of plain water, which renders the bath, like Paddy's nether garment, indestructible, although it is being continually renewed after an imperceptible fashion.

The quantities above stated will, perhaps, prove too great for amateurs and photographers with a small business; they may commence with 1 gallon, but, in strengthening afterwards, the proportionate amount of reduction in the amount of gold used must not be made. For 2 grains of gold $\frac{1}{2}$ gallon only of the stock solution must be employed.

In concluding this lengthened article I do not promise success invariable to those who neglect principles; nor can I hold out hopes of a freedom from failure being secured by the inexperienced. I have been closely engaged in photographic printing for years; to that branch of photography I have applied my whole mental powers; yet a week never passes over my head but I observe and note something new. If my mountain seems to some to have produced only a mouse, I would have them remember that little things are only neglected by very little minds. I have seen a cloud no bigger than a man's hand rise from beneath the horizon; I have watched that cloud, and have seen it extend and cover the heavens. A brief instant, and the shrieking blast swept o'er the face of the waters, whose placid surface was at once transformed into crested ridges and threatening gulfs; yet all this wild tumult commenced with a small cloud as described. I must now conclude; and my next I purpose devoting to a further consideration of the principles connected with my toning bath, a knowledge of which will tend to secure uniformity of success, considerations which must be regarded as aids to experience. Meantime I shall be glad to receive all enquiries and particulars of experience from those who desire further information. The replies I propose embodying in a special paper devoted to any correspondence I may receive.

PHOTO-ZINCOGRAPHY IN PRACTICE.*

BY J. WATERHOUSE, R.A.

THE PREPARATION OF TRANSFERS IN GREASY INK.

THE object in this part of the process is to obtain a positive image in greasy ink on paper, which may be transferred to a zinc plate or lithographic stone, and printed off in the ordinary way.

The rationale of carbon processes in general is now well known, and depends on the property possessed by the alkaline bichromates of rendering gelatine, gum, albumen, &c., insoluble under the influence of light. If we coat a piece of paper with a mixture of bichromate and gelatine to which some pigment has been added, and expose it to light under a negative, we shall find on washing it in water that the parts acted on by light have remained insoluble, forming a

positive image in pigment, while the unexposed parts, which retained their solubility, have been washed away, leaving the paper perfectly clear. The effect is the same if the paper be coated after exposure with a thin layer of greasy ink, and then washed; and this simple fact is the foundation of all the photo-lithographic processes.

The first thing to consider is the paper, the quality of which is of importance. The paper found to answer best for this process is that known as bank post; it is made from linen, and, being hard and tough, stands the washing well. A medium thickness should be chosen; if it is too thin it is liable to tear, and if too thick, too much of the solution is absorbed. If bank post paper cannot be obtained, ordinary Rive paper will answer.

PREPARATION OF THE SENSITIVE PAPER.

There are two ways of preparing the sensitive paper: either by floating it on a warm mixture of bichromate of potash and gelatine, or by immersing paper previously coated with gelatine in a cold solution of bichromate of potash.

I prefer the latter plan, especially for amateurs. A quantity of the paper may be prepared with gelatine at any time, and one operation only is required for the sensitizing, which may be done in the evening, and the paper will be found dry and fit for use in the morning.

The proportions of the bichromate and gelatine are influenced by several considerations. The bichromate should not be more than sufficient to render the gelatine wholly insoluble under the influence of light; excess of bichromate produces crystallization on the surface of the paper, and rapidly causes the spontaneous decomposition of the gelatine without the aid of light. In India, so rapid was the decomposition under the combined influence of great heat and moisture, that the proportion of bichromate was sometimes reduced so low as 3 drachms to 40 ounces of the gelatine mixture, but with a corresponding loss of sensitiveness.

The coating of gelatine must not be too thick, or the finer lines will not be impressed through the coating, and will be washed away in the after operations, and when damping the transfers before transferring to zinc, it will be found that the gelatine under the lines will soften by absorbing too much moisture, and will be liable to spread on the plate. On the other hand, the coating must not be too thin; otherwise, when the paper is inked in the press, the ink will be forced into the substance of the paper, and the ground will be irremediably stained. I have obtained sharper results by using a moderate thickness of gelatine than with a thin coating. The quality of the gelatine is important. The ordinary cooking gelatine is not suitable; Nelson's patent fine cut is the best. The French gelatine, sold in thin transparent sheets, will answer, and so will the substance sold under the name of Russian glue, at a much less price than gelatine.

For the preparation of the paper, a metal hot water dish will be found useful. It should be similar in form to the trays used for waxing paper in the days of the waxed paper process. The upper tray should be made of zinc or enamelled iron, and should fit into a metal box one inch larger every way, supported on iron legs, so that heat might be applied by means of a spirit lamp or gas jet, &c., so as to keep the temperature of the solution at about 100°.

I will now describe the details of both methods of sensitizing. The proportions given below will be found to answer well for general purposes.

The formula for the mixed sensitizing solution is,—

Bichromate potash	...	...	...	2 ounces
Nelson's gelatine	...	...	...	3 "
Water	...	...	...	50 "

The bichromate is dissolved in 10 ounces of hot water and added to the gelatine dissolved in 40 ounces of water; the mixture is then strained through flannel into a flat dish placed in another containing warm water. The paper is care-

* Continued from p. 295.

fully laid on the solution so as to avoid bubbles, and allowed to remain about three minutes; it is then hung up to dry. When dry it is floated again, taking care to hang it up by the end which was lowest before; this is necessary to secure an even coating of the proper thickness.

The paper is then passed through a copper-plate press, to make the surface perfectly smooth. All these operations must be conducted in a dark room.

In the separate method the paper is coated in the same manner with two coats of

Gelatine	3 ounces
Water	50 ..

passed through the press, and put away in a dry place. To sensitize it, it is immersed for one minute in a cold solution of 1 ounce bichromate of potash in 12 ounces of water; it is again pressed, and is ready for use.

The paper prepared by either method will not keep good very long. It is better not to use it quite fresh, but about a day old; in dry, cold weather, it will keep for a month, but it can seldom be relied on after a week, and in very hot damp weather must be used almost as soon as prepared.

The sensitizing must be carried on in a dark room, and the paper must be carefully kept from the influence of light, as it is far more sensitive than the ordinary silver paper.

EXPOSURE TO LIGHT UNDER THE NEGATIVE.

This is an important part of the process, and one in which experience alone can be a sure guide. With very sensitive paper and a perfect negative, in strong sunshine, from 20 seconds to a minute will be found enough. In dull weather, or with bad negatives, the time may be increased to ten minutes or a quarter of an hour, or longer, but is in all cases much less than could be required by a silver print. The conditions affecting the exposure are, the amount of bichromate in the paper (the sensitiveness being increased by the addition of bichromate), the chemical intensity of the light, and the quality of the negative. If a negative is denser in some parts than others, the clear parts may be covered over, while longer exposure is given to the rest. The only rule I can give for exposure is to print till the fine lines are visible. The colour of the lines is the best guide; they should appear of a dark reddish brown on a bright yellow ground. During the exposure, care must be taken not to expose the ground of the prints to light when examining them. The next stage is the

INKING OF THE PRINT.

The prints have now to receive a coating of greasy ink. The composition of the ink is important. It must not be too soft, or it will clog the sponge when washing it off, and it will be very difficult to obtain fine, clean lines. If the ink is too tough, some difficulty will be experienced in clearing it off the ground, especially if the paper has been kept for some days. I have found the ordinary retransfer ink answer very well.

The following is the formula for the ink used at Southampton, and the mode of preparing it:—

Litho printing ink	8 ounces
Middle varnish	4 "
Burgundy pitch	3 "
Palm oil	$\frac{1}{2}$ ounce
Wax	$\frac{1}{2}$ "
Bitumen	1 "

To prepare it, grind the ink and varnish well together with a muller on a stone slab. Melt the Burgundy pitch in an iron pot over a clear fire till the water is driven off, then add, by degrees, the wax, in small pieces; when that is melted add the palm oil, and stir well together with a spatula; when they are well melted, light a piece of paper and try if the vapour will catch fire; if it does, it shows that the heat is sufficient to melt the asphaltum, which is then added in fine powder. It is afterwards set fire to again. Now add the

ink, little by little, and well mix it. The saucepan is then taken off the fire, and, when cooled, pour out the contents, and well mix them on the slab with a muller, taking small quantities at a time. It should then be put away in tins. Ink for half tones is heated more, so as to make it a little harder; the ingredients remain the same. If the ink should harden in time, the addition of a little palm-oil will be found to improve it.

When about to ink the prints a quantity of the ink is taken and melted with sufficient turpentine to give it the consistency of honey. This is well worked on the inking stone with the roller, and an even coat of it is spread on a polished litho stone or polished zinc plate. The prints are laid face downwards on the inked surface, a sheet of paper is placed over them, and they are passed through the press with a lighter pressure than is used for printing. After being passed through once the prints are examined, and if the coating appears perfect they are removed; if not, they are taken off, turned end for end, and laid down again; if necessary the plate should be rolled in with ink again; they are then passed through the press, and when again examined should have a perfect coat of ink through which the detail of the subject is faintly visible. Care must be taken not to allow the ink to stain the back of the prints; the paper covering them must be changed as often as necessary. This mode of inking the prints is the most cleanly and convenient, but there are other modes which in some cases may be preferable, especially if the work is fine and the coat of gelatine thin. The best of these methods is to apply the ink with a piece of sponge. A tolerably even coating can be given in this way. The ink may also be applied with a small hand-roller. The print is pinned down, face upwards, on a board covered with paper, and the ink applied with the roller till an even coating is obtained. By whatever mode the print is inked the object is to get a thin, even coating of ink, and it must be borne in mind that the thinner and closer the lines the thinner the coat of ink should be. The amount of ink on the print should not be in excess, or else there will be a tendency for the lines to spread under the press.

This operation must be carried on in a dark room.

DEVELOPMENT OF THE TRANSFERS.

The transfers, having been inked, are taken into a dark room, and floated on the surface of water at about 90°; it should not be warmer. They are allowed to remain till the unaltered gelatine is softened and the detail becomes clearly visible in intaglio. They are then taken off the water and laid on a sloping plate of glass in another tray; warm water is poured over them, and the soluble gelatine is gently removed by rubbing with a very soft sponge. There is no necessity to clean the transfers entirely at this stage, but when most of the ink has been removed they are placed in a dish of warmer water and allowed to soak for an hour or so, and then washed again with the sponge very gently till they are clear; this may be done by daylight. If the paper has been kept for some time, or has become decomposed from any other cause, the ink will not leave the ground of the print; in this case the transfer may be left in soak for some hours, or till the next morning, and then washed in hot water, which will generally remove the ink; but if it does not do so it is better to throw the prints away and try again with fresher paper. In washing the transfers, care must be taken to keep the sponge full of water, so as to ensure a constant flow of water over the surface of the print, to wash off the ink as it becomes disengaged; if allowed to rest on the paper after the gelatine has been removed it is liable to stain. When the transfers are perfectly clean they are finally washed, front and back, in a dish of clean, cold water, and hung up to dry.

They are now ready for transfer to stone or zinc, but it is better to keep them twenty-four hours before they are transferred.

(To be continued.)

REMARKS UPON THE CARBON PROCESS

As PRACTISED IN THE PHOTOGRAPHIC LABORATORY OF THE
ROYAL INDUSTRIAL COLLEGE AT BERLIN.

BY DR. H. VOGEL.*

I.—Recent Experiments in Carbon Printing.

SOME time since I communicated the fact that I had been enabled to dispense with the use of gelatine in transferring carbon prints.† At the time I made known this modification of the process, I myself had some doubt of its practical value, so incredible did the results appear; but after eight weeks of continued experiment, during which time several hundreds of pictures have been produced and transferred without the aid of gelatine, the importance of this innovation in the method has been fully established. The disagreeable operations of preparing, filtering, and applying the gelatine solution, as likewise the delay involved by allowing the same to dry, the risk of the formation of air-bubbles in the solution, and the difficulty of re-dissolving, are some of the time-taking operations which are thus avoided. On two occasions only did I experience a difficulty in removing the picture, after treatment with benzole some portions of the prints remaining attached to the india-rubber. In one of these instances I subsequently removed the picture by means of rubbing both sides well with benzole; but in the other I was not so successful, inasmuch as a portion of the print became torn during the operation of dissolving off the rubber. To obviate a recurrence of this difficulty, I discontinued the operation of dissolving, and placed a number of the prints in a dish under a piece of plate glass, pouring over them a quantity of benzol, and allowing them to become perfectly saturated with the same. The evaporation of the benzole was prevented by placing the vessel containing it into another larger dish, in which a certain quantity of water had been poured, and then covering over the prints with an inverted shell which dipped down into the water. After remaining immersed in the benzole for ten minutes, the pictures were dissolved off with the greatest ease. Recourse to this mode of proceeding need, of course, only be made when it is found impossible to dissolve away the india-rubber in the ordinary manner; but, in any case, very little benzole is expended in the operation.

The reason of this occasional difficulty in removing the pictures lies in the quality of the india-rubber sheet and solution employed. It is not every description of rubber, even if it dissolves entirely in benzole, that is suitable for use, and it becomes therefore the duty of dealers in photographic requisites to obtain a material of requisite quality. If the rubber sheet and solution employed is of the proper kind, it is necessary merely to moisten the side of the rubber sheet with benzol in order to bring about a perfect separation.

Another great advantage of the non-employment of gelatine is the guarantee it affords of the security with which the rolling-press may be used. When employing the method of transferring with gelatine I frequently had misfortunes with the roller, the pictures being crushed and thus rendered blurred and even quite worthless, and it was for this reason that I had recourse, like Mr. Cherrill, to the screw-press. But without gelatine, manipulation with the rolling-press answers admirably; nor is there the slightest risk of accident to be feared from its use; it is necessary, however, that the roller should be well fitted and perfect in every respect. The following will be found the most successful manner to manipulate:—On the steel plate I place a smooth piece of four-sheet cardboard, and upon this a square of cloth or felt; the white transfer paper, which has been immersed in water for about a minute and then quickly dried upon blotting-paper, is placed, together with the developed india-rubber picture, between the cardboard and the felt, and run through the machine. One single rolling operation is sufficient, but the india-rubber picture should be pressed by

hand evenly down upon the transfer paper before the piece of felt is placed over it and the operation of rolling takes place. For small pictures the screw-press is more convenient; the rolled pictures dry very rapidly, and may be treated with the tanning solution (chrome alum 1 part to water 300 parts) within half an hour of their being pressed. Instead of coating the picture with the alum solution, it is better to immerse it bodily into the liquid for a period of one minute, and then to allow it to dry in a temperature of about 15° Reaumur. In an hour the prints are ready for the application of benzol.

One more advantage secured by the abandonment of gelatine in transferring yet remains to be mentioned. It is the possibility of being able to preserve the india rubber dissolved from the prints, and to utilize it a second time.

II.—The Carbon Process without the use of India-rubber.

In the last number of the *Mittheilungen* I mentioned that I had been enabled to produce carbon prints with only one transferring operation, dispensing thereby with the employment of india rubber tissue. Experiments in this direction have likewise been made by M. Marion, of Paris; but that gentleman employs not ordinary paper upon which to transfer his pictures, but albuminized paper, such as was suggested some four years ago by Henderson for the same purpose.

M. Marion's mode of proceeding is to lay the exposed carbon print in cold water, changing the latter frequently until the whole of the chromate has been discharged, and thus to bring out the image in relief. A sheet of albuminized paper is then floated upon water (face uppermost), the carbon print is placed upon it, and both removed from the water at the same time, and pressed. A large number of prints may be placed one upon the other in this fashion, and the whole pressed in one operation. After being under pressure for about two hours the pictures are hung up to dry, and afterwards placed in a hermetically closed vessel, where they are exposed to the action of steam. By this means the albumen becomes coagulated, and there remains nothing further to be done than to develop the prints more fully, and to wash them in warm water, the picture, of course, remaining firmly attached to the albuminized paper. The image is, however, reversed.

Although the albumen is unnecessary as a cementing material, I was of opinion that, on account of the homogeneous and brilliant surface which it presents, its employment presented many advantages over ordinary paper. For this reason I instituted a trial of this transferring process with albumen, although I went to work on a different plan from that pursued by M. Marion. The albuminized sheets were first coagulated and immersed in water, then blotted upon filtering-paper, and passed through the roller, together with a dry carbon print, in the same manner as when manipulating with ordinary paper; after drying for about an hour, the pictures were placed in cold water for a like period to develop, and subsequently in warm water. The pictures developed well, and with fewer air-bubbles than when ordinary paper was used. They possessed a certain amount of brilliancy, and had somewhat the appearance of silver prints upon albuminized paper, but they did not possess the beautiful glossy black tones presented by carbon prints produced in the ordinary way, and the whites were certainly less pure than those of prints transferred upon ordinary paper. At the same time, the pictures on albuminized paper exhibited less tendency to tear than the others.

The transfer process is always best conducted (if either albuminized or ordinary paper is used) by having the transfer paper of somewhat smaller dimensions than the carbon print, so that the latter may overlap on all sides to the extent of a quarter of an inch. I likewise essayed the transfer of the exposed carbon tissue, after saturation in water, to dry coagulated albuminized paper, but found it difficult in this case to avoid creases in the picture, a difficulty, however, which is overcome by previously moistening the albuminized paper.

* *Photographische Mittheilungen*,

† See page 200.

MAGNIFIED PHOTOGRAPHIC PICTURES.*

If it were possible to take a photograph, say of the moon, and then to take a second one of a portion of the first, and of the same size as the first, and to repeat the process as often as required, a picture might at last be obtained that would show the minute details in the structure of that body; and in the same way the minutest details in the structure of other bodies, now beyond the reach of the most powerful microscopes, might be shown and examined at leisure. In the present state of science it is not possible to accomplish this, for several reasons.

First, the photographic picture is painted by the deposit of metallic silver, which, in a minute state of subdivision, gives a general grey tone to the picture when it is not magnified; but when the entire picture, or a small portion of it, is inspected by means of lenses, the white lustre of the silver appears more and more plainly as lenses of higher power are used, and the picture assumes a frosted and crystalline appearance, which obscures the finer details beyond a certain limit. The limit is reached by a lens of quite low power, and photographic pictures when viewed in stereoscopes show more or less of the silvery frosted-looking surface texture. To obviate this difficulty a substance must be discovered as sensitive to light as the salts of silver now in general use for photographic purposes, and that will in its decomposition leave a perfectly amorphous coating upon the paper, where the light acts, and in proportion to the strength of its action, from the lightest grey tint to the deepest black.

A second difficulty is the roughness of all surfaces upon which pictures can at present be taken. If we attempt to magnify a photograph, all the roughness of the paper or collodion which is imperceptible to unaided vision becomes apparent, and mingles its own images with that of the finer details in such a way as to make complete confusion. The remedy is the discovery of new materials capable of receiving a polish so fine as to show a perfectly smooth surface under the highest magnifying powers.

The third and the greatest difficulty is the fact that in enlarging small pictures the amount of light reflected by them is constantly diminished, each picture becoming more indistinct than the one of which it is a copy, until finally the original image is completely extinguished. Formidable as this difficulty appears, it is within the range of possibility that it may be completely overcome. The reinforcement of the galvanic current obviates a similar difficulty which at one time threatened to interfere greatly with telegraphic communication. The reinforcement of a sound can make it audible through a large space where it apparently had totally ceased to exist. It remains to discover a means for the reinforcement of light. We believe that in time to come all the obstacles we have mentioned will be surmounted, and the photographic art will become the means of revealing the yet hidden mysteries of nature's grand laboratory.

Another difficulty, that relating to the imperfection of lenses, we will hereafter discuss.

PRINTING BY DEVELOPMENT.†

THE paper is made to float upon the sensitizing bath for the space of three minutes, and is then allowed to dry. While yet damp it is exposed under a varnished negative, or upon the screen of the solar camera, for a few seconds. No image whatever should be visible, but in dull weather, with feeble lighting, an exposure of half a minute is necessary. The picture is developed by pouring over it, in the manner already indicated, a saturated solution of gallic acid containing about one-third of its volume of aceto-nitrate of silver. If the development is of long duration, then the exposure has been too limited; or if, on the other hand, the picture appears

very rapidly, the image has been over-exposed. When all the details of the picture are distinctly visible, it is plunged into water and carefully washed to eliminate all trace of gallic acid, and it is then put into a solution of hyposulphite of soda prepared as follows:—

Hypsulphite of soda	...	...	60 grammes
Water	...	...	300 cub. cents.
Chloride of gold	...	...	0·13 grammes.

If the exposure has been of sufficiently long duration, the aspect of the print will not change materially when treated in the hyposulphite bath; but if the exposure has been inadequate, the dark portions of the picture will change to a pale red colour. Sometimes it will happen that the tone of the shadows does not darken sufficiently in the developing bath, owing to the gallic acid not containing enough acetate of silver, and it is therefore best to add a small quantity of the latter material, by degrees, during the process of development, whenever it is found that there is an absence of vigour in the print. The addition of chloride of gold may be dispensed with in the fixing bath if the pictures tone sufficiently black in the hyposulphite alone.

Method of Sensitizing by means of Nitrate of Uranium
(Niece de St. Victor's method).

The paper used in this process should be kept in the dark, or, at any rate, well screened from light, some time previously to its preparation. It is sensitized by floating upon a solution prepared as follows:—

Sensitizing Bath.

Nitrate of uranium	...	...	30 grammes
Distilled water	...	...	150 cub. cents.

After remaining in contact with this liquid for three minutes, the paper is removed, drained, and hung up to dry. Thus prepared, it may be kept for a considerable period, if carefully protected from the action of light. The time of exposure under a negative varies, of course, with the intensity of the light at the time being, but may be estimated at between one to ten minutes in the sun, and a quarter of an hour to an hour in weak diffused light. The image is slightly visible after exposure, and is developed with the following:—

Developer—Formula No. 1.

Nitrate of silver	...	...	4 grammes
Acetic acid	...	...	1 or 2 drops
Distilled water	...	...	60 cub. cents.

The development is very rapid, the image coming out in all its vigour very soon after its immersion in the bath. When it has been sufficiently developed, it is immersed in cold water, washed, and afterwards fixed.

Formula No. 2.

Chloride of gold	...	...	0·65 grammes
Hydrochloric acid	...	...	1 drop
Distilled water	...	...	365 cub. cents.

Correspondence.

PHOTOGRAPHS OF THE MOON.

SIR,—A detailed description, with illustrations, has recently been published by the *Engineer* of Mr. Warren de la Rue's apparatus, machinery, and method of procedure in obtaining photographs of the moon and other celestial bodies. This description, with the diagrams, has been reproduced by some photographic journalists; and I take the liberty of begging to be allowed to call attention to one part of the narrative which affects myself, and, as I apprehend, does me rather scant justice. It is known that in the year 1853 I produced a stereoscopic transparency of the moon, published by Messrs. Horne and Thornthwaite. I devoted nearly three years to the production of lunar photography, and was, I believe, the only one besides Mr. De la Rue who produced, either privately or on a commercial scale, a stereoscopic transparent combination, enlarged from the original negatives (of 7·86 in diameter), and which were truly and absolutely stereoscopic from the laboratory angle at which each picture was taken. I think, then, it scarcely does justice to the time I devoted, or the success I am acknowledged

* *Scientific American.*

† Continued from p. 115.

to have achieved, to read that, "after 1854 more or less has been done in astronomical photography by Messrs. Hartnup, J. A. Forrest, McInnes, Crookes, Fry, Huggins, W. Allan Millar, and Padre Secchi." True, it may be thought to be sufficient honour to be classed at all with names of men several of whom are of European celebrity; but although there are large numbers of your readers who would not fall into error on the matter, still some might be misled, and for that reason I beg the use of your widely-extended columns on the matter.

There is, of course, a very wide difference between actual stereoscopic coincidence and mere lenticular rotundity. If two exactly identical pictures are placed in an adjusting stereoscope, many persons really believe they are stereoscopic, and on this principle a lunar combination on paper was issued. I had means of knowing that the person who produced it only had access to the Observatory a few consecutive days, and when such was the position of the satellite that a true combination would have been impossible. In the case of the picture I published, the whole result was anticipated by careful astronomical calculation: about thirteen months intervened between the taking of the two pictures which coalesced, and I had prognosticated the very hour when success would be achieved, if only the atmosphere permitted. Every available spot in the Observatory and adjoining apartments were filled at the appointed time by scientific men, many of whom came a long distance to be present; and when at 3:25 in the morning a picture was obtained, having in every detail the most complete coalescence with the first taken, I was congratulated on all sides.

Sir, every man has in the course of his life certain occurrences the reminiscences of which are pleasant, and over whose details he warms up in after years, just as did the old soldier when he "shouldered his crutch and showed how fields were won." I am free to confess, then, that—justly or otherwise—I look back with undiminished pleasure at what I did when experimenting on lunar photography; it may have been "more or less," but considering the great length of time I devoted to it, and that all I had in view was accomplished most fully, I feel a little jealous at what seems a rather depreciatory expression.

SAMUEL FRY.

[It is an unfortunate fact, that the long and arduous work involved in securing reasonably good results in the more purely scientific branches of photography rarely meet with adequate recognition; but it is, on the other hand, a fortunate fact, that they are often labours of love, and prove to the earnest experimentalist their own reward. Mr. Fry's admirable stereoscopic transparencies of the moon are, however, well known to and appreciated by most persons practically familiar with the history of astronomical photography.—ED.]

THE TRANSMISSION OF ACTINISM BY LIGHT.

DEAR SIR,—Being desirous to keep you informed on some humble experiments of mine on the comparative power of different kinds of glass to transmit the chemical rays, and it not being convenient to take many sensitive paper impressions, or to send so large a sheet to all of my correspondents, I sent you some time ago a reduced photograph; *i.e.*, copy of one of my most interesting prints. By an oversight of mine, I did not inform you of the points of difference between the original and the copies, which did not truly represent the former, and led to the wrong and curious appearances to which you refer in your News of April 3rd. In the first place, in all of my original sheets, the ground glass cuts off a very large amount of the actinic rays, leaving beneath it a much lighter impression on the sensitive paper than under the unground glass. In the second place, the Belgian sheet in the copy showed so dark an impression as to appear superior to all the other colourless glasses; while in the original, the French plate displayed an equal or greater actinic power. In the copy, from reflected light or some other causes, some portions appear much lighter, and others comparatively darker, than they did in the sensitive paper sheet.

The curious fact about the yellow showing some actinic power is explained by my having used stained glass in making the sheet sent to you. In another sheet, in which I used pot-metal, no impression was made under the yellow specimen. I think that many mistakes may have been made in scientific observations and in photographic studios from using stained instead of pot-metal glass. In the latter the colour permeates the whole body of the glass, while in the former it is only

burnt upon the surface, and frequently in a very thin layer. Photographers, I think, should always use the pot-metal.

I have made one sheet with a row of pot-metal glasses of various colours, and another row of stained or flushed glasses of the same colours, and another sheet with special reference to the comparative actinic powers of ground and unground glass. I have also made other experiments of a similar character, involving some time, thought, and labour, of which, when completed, I shall be most happy to write a full account. I shall endeavour in future to send you original sensitive paper sheets, or to note carefully the slightest variations or defects which may occur in a photographic copy, and thus avoid any wrong impressions which might otherwise be made.

I do not make any pretensions to scientific knowledge or photographic skill, but I shall be exceedingly gratified if my humble investigations, pursued at intervals snatched from business and private cares, shall give light or aid to any class of my fellow-beings in their daily round of labour or of thought.

T. G.

Boston, June 6th, 1868.

[We shall at all times have pleasure in receiving the interesting communications of Mr. Gaffield on this important subject, which has hitherto received but too little attention.—ED.]

PERMANGATE IN THE NITRATE BATH.—THE COFFEE PRESERVATIVE.

SIR,—Permanganate of potash for rectifying the negative bath turns out in my hands a complete failure.

I have during the past week tried it upon three baths in succession with exactly the same results in each case. That it clears the solution from organic matter there is no doubt, but at the same produces a condition of the bath that renders it susceptible of derangement in an incredibly short time.

The following is my mode of proceeding:—About a drachm of a 10-grain solution of permanganate of potash was added to the bath, 30 ounces, agitating between each addition, and exposed to sunshine. In a short time the solution assumed a coffee-coloured hue. After standing all night a lightish brown sediment had fallen to the bottom, leaving the solution clear and bright. This was filtered into the bath, and a plate tried: the negative turned out all that could be desired—bright, clear, and vigorous. Two or three other negatives were taken during the afternoon, all of which were satisfactory.

But—could you believe it?—the first plate coming out of this identical bath the following morning showed the most wretched case of fogging I ever beheld. Two other baths (I always use three) were treated in like manner, with the same result in each case—all right for a few plates, and after standing all night, worthless from fog. In all the three cases the baths were slightly acid to litmus paper. Can you explain this phenomenon?

I was somewhat alarmed on Saturday afternoon by a violent explosion in my laboratory. On seeking to ascertain the cause, I found it to have proceeded from a bottle containing a solution of coffee which had been prepared for the coffee dry process. The bottle, a very strong one and tightly corked, was shattered to fragments; and had I been near at the time, I might have suffered injury from pieces of the bottle which were driven with great violence in every direction. I did not know before that there is anything in coffee so powerful as this. Fermentation, I suppose, would be the cause of the explosion. I had noticed a few days before mould floating on the surface of the liquid.—With thanks for past favours, I am, yours, &c. R. M.

Preston, June 21st, 1868.

[The probable cause of the failure of the permanganate is the addition of excess; and by the decomposition following, acetate of silver has been formed, which is often a cause of fog. A few drops of a 10-grain solution are generally sufficient. The only probable cause of the explosion is the fermentation of the liquid containing sugar. We see no reason for supposing that the coffee played any part in producing the result.—ED.]

WET PHOTOGRAPHY IN THE FIELD WITHOUT A TENT.

DEAR SIR,—You have often spoken in favourable terms of my apparatus for photographing without a tent, but I am afraid that either such an apparatus is not required, or that there is a disinclination to attempt to make it from the description in the

first volume of the *News*. However complicated it may appear from that description, the apparatus itself is perfectly simple, and if any manufacturer should feel disposed to make it, I can only say that both the single and stereoscopic apparatus are quite at his service. Five minutes' explanation would make the working perfectly intelligible. Having given up the "camera" for the "brush" for some years, I have not used any of the new developers, some of which I think would be peculiarly adapted to the working this process. Perhaps, however, the developers I described would have some advantage over the others, inasmuch as with that the negative does not fog by exposure to light after the developing action is once set up. Probably organic matter might cause it to fog if exposed to light before fixing.

However, it is very desirable to get sufficient density in the negative at once.

There has been much written lately upon enlarging from small negatives, but nothing can be more simple and inexpensive than the camera for that purpose, which I described also in the first volume of the *News*: the process being to take a perfect positive in the camera from the small negative, either the same size or a little larger, and from that, before varnishing, to take a negative for printing up to the size required, if that size be not too large for sharpness on the ground glass.—I remain, dear sir, yours truly, THOMAS BARRETT.

Red Hill, Reigate, 19th June, 1868.

MODES OF TONING.

SIR,—I have read with much interest the papers from the pen of Mr. Bovey, but last week I was surprised, not so much with his manner of toning, as with the sweeping assertions conveyed in that paper. He lays down his theory as the only correct one; the proving of this rests with himself, but it does seem strange that so many high authorities should for so long a time have been altogether wrong.

Without classing myself amongst those authorities, nor yet amongst those "who borrow ready manufactured ideas, and consider themselves clever because of their borrowed plumes." I ask leave to state my own experience, which is directly opposed to that of Mr. Bovey.

I wash my prints well in six or eight waters, and then rub each one with a bit of cotton wool till no trace of silver can be observed in the last water. I then put them into one of "those abominable and unscientifically concocted messes known as alkaline toning solutions," which Mr. Bovey says "will inevitably produce meanness, &c."

I have not seen any of Mr. Bovey's work, so cannot judge of its superior merit; but I take the liberty of enclosing three prints from my last batch. Your opinion of them will oblige.

We have a proverb here, in the North country, that "doctors differ, and so do divines;" so also do photographers, and it may happen that truth lies between the differing parties.—I am sir, your obedient servant, G. B.

[In toning, as in many other branches of photographic operation, practice is considerably ahead of theory, and most of the toning formulae are empirical rather than scientific. Very little has been written, and very little is commonly understood, about the theory of toning. Not one photographer in a thousand, perhaps, knows why he adds acetate of soda, chloride of lime, carbonate of soda, &c., &c., to the solution of chloride of gold; whilst many thousands, by carefully following the various formula which experience has proved to work well, succeed in producing good results. The prints sent by our correspondent are excellent. He does not state the formula employed: possibly the term "alkaline" may be a misnomer in reference to it, as it is to the bath with acetate of soda. We think that Mr. Bovey's theory is open to discussion, but as a practical printer of very great skill and much practice, and a thoughtful observer, his opinion is entitled to careful consideration. His practice, we know, produces admirable results. In any case it will be wise to read carefully the complete article, finished this week, before discussing the question.—Ed.]

Talk in the Studio.

PATENT ARTISTIC PRINTING PROCESS.—An interesting exhibition of examples of a process patented by Mr. Frederick Piercy is now open at Mr. Graves' Fine Art Gallery, No. 11, Haymarket. The portraits consist chiefly of large vignetted heads in various proportions up to life size. The result is

obtained by a mode of applying lithographic printing to the photograph, which, in conjunction with skilful artistic labour, produces a singularly pleasing effect of modelling and finish. In some respects the pictures have the appearance of a careful and elaborately worked crayon picture on a tinted ground; but there is beyond this an effect *sui generis* which we have not seen produced by any other means. We hope shortly to publish the details of the process; but although it consists in the application of a mechanical method of printing, the results are dependent on the employment of a high degree of artistic skill which Mr. Piercy has brought to bear in the very admirable examples now on exhibition, of which we recommend an examination.

CABINET PORTRAITURE IN AMERICA.—We have recently had the pleasure of examining a selection of cabinet portraits by Mr. Fassett, of Chicago, which are amongst the most charming examples of this style of portraiture we have met with. Original, graceful, and spirited in pose, they illustrate how admirably the cabinet size permits the rendering of pictorial effect in portraiture. The lighting is very perfect indeed, producing exceedingly brilliant and perfect effect of light and shade, and, at the same time, great delicacy and fine modelling. Some examples, with painted background, of an interior are capital in effect, the design being quiet, natural, and unobtrusive, and in all cases preserving a correspondence with the lighting on the figure. With such examples as those before us we can readily understand that the cabinet portrait must become a very decided favourite with the public, as we understand that they have already done in the United States.

LEATHER COLLODION.—Mr. Arthur Taylor recently called our attention to the fact that M. Schonbein, when he visited this country shortly after his discovery of gun-cotton, exhibited some examples of what he termed "malleable glass," which resembled the pellicles recently introduced to photographers under various names, such as "leather collodion," "vitrified india-rubber sheet," &c., with the difference that whilst quite colourless, transparent, and flexible, they were thicker than the modern pellicles. These were supposed to be products of his new discovery, but their composition was not explained; there can be little doubt that they consisted really of thick collodion films, but whether the collodion had received any addition—such as castor oil—now common, or whether they were formed from a simple ethereal solution of gun-cotton, we have no means of judging.

THE PROGRESS OF PICTORIAL ART.—The *Daily Telegraph* says:—"Our whole social life has become, through the development of art, much more pictorial than it was. Thirty years ago none but rich men had family pictures; now there is hardly a servant girl that has not a portrait gallery packed up in her box: her mother, her sister, her sweetheart, her cousin at sea, her friend, her former mistress, or the baby she nursed, are there, in photographs, to give her vivid memories and brighten up exile or loneliness. Our illustrated contemporaries report events in pictures. Sketches in 'Punch' or photographs make us familiar with every line of the faces of our eminent men. Carlyle often laments that there are so few good portraits of the great men of old; but a similar complaint cannot be made by the generation that will follow us to criticise our doings and estimate our work. Is all this wrong? We do not believe it."

PERMANENCY OF COLLODION FILMS.—A correspondent says: "About eight years ago I coloured some cards in powder colours by Mansion's method, and instead of varnish I poured over them some plain collodion. They have been exposed to damp, heat, and sun, and not a single film of collodion has ever been affected in any way, so that I believe a collodion film as permanent a material as possible to be for photographs. The collodion film in a spongy state, as it is as an unvarnished negative, when it can easily be rubbed off with the finger, is another matter altogether."

VARNISHING ALBUMINIZED PRINTS.—A correspondent says: "I find by ten years' experience of varnish, and also collodion, upon albuminized prints, that neither the one nor the other will prevent them from turning yellow."

THE COMING SOLAR ECLIPSE.—We learn from our friend and collaborator, Dr. Vogel, that he proceeds next month to Arabia, as one of a commission sent out by the Prussian Government to photograph the coming solar eclipse.

THE PHENOMENA OF LIGHT.—A number of experiments, as illustrating the phenomena of light, are described in an American contemporary, by Professor Henry Morton. The

following, among others, were especially interesting:—"The Professor placed himself and apparatus on a platform secured to one of the stage traps, and then was raised to a great height above the floor, at which elevation he burned in the compound blowpipe a piece of thick steel wire rope. The fountain of scintillating sparks and drops of melted steel which, descending in a broad sheet some fifteen feet in height, poured upon the stage and rolled in a torrent of fiery hail toward the foot-lights, was a sight never to be forgotten. A wheel five feet in diameter, supporting electrical tubes, was rotated, while flashes of electric fire from the largest induction coil in the world, belonging to the University of Pennsylvania, were passed through, producing a dazzling star of constantly changing coloured rays. The drop curtain, descending for a few moments, rose again, displaying a beautiful palace scene, illuminated by numerous lime lights, judiciously placed. There then marched in a great number of masked figures, in costumes representing the colours of the rainbow, and bearing banners with brilliant devices. These, taking positions, formed a tableau equal in brilliancy and beauty of general effect to anything we have ever seen upon the stage. At a signal the white light was extinguished and its place supplied by pure yellow light, equally bright, when every trace of colour disappeared, and the entire phalanx became a ghastly company of spectres bearing banners of white and black. The means for producing this yellow light is a device of Professor Morton's, entirely new and eminently efficient; in fact, the entire house was illuminated with it from the stage, so that the same wonderful change was manifest in the faces and costumes of the audience.

NEW ENGRAVING LATHE.—The *Scientific American* describes an ingenious and effective lathe for engraving upon copper, steel, wood, and other substances now in operation in New York, which is worthy the attention of all who are interested in the reproduction of art. To engrave by means of this machine the operator sits with a copy of the drawing, photograph, or whatever design is to be engraved, directly in front of him. A small pointer rests upon the drawing, and the whole operation consists in moving the pointer over the several lines of the copy. The pointer is operated by two small cranks, one of which produces a vertical and the other a lateral movement; the simultaneous operation of both cranks producing a circular, inclined, or any desired irregular motion of the pointer, which is thus made to "follow copy." All the movements of the pointer are imparted by means of a very simple arrangement of levers to a graver which cuts or engraves the design upon the surface of a copper plate or block. Thus, in a rapid manner, even an unskilled person, having a drawing before him, may engrave the same in superior style. The swelled lines as well as hair lines of copper plate writing may be produced with the utmost freedom, and there seems to be no limit to the execution of the finest and most difficult as well as the simplest kinds of work.

ANTIDOTE TO CYANIDE.—A daily contemporary says: "Photographers will be glad to hear that the painful ulcers and other bad symptoms produced by cyanide of potassium may be effectually prevented by rubbing the hands, when soiled with it, with a mixture of protosulphate of iron, reduced to a very fine powder, and linseed oil."

To Correspondents.

A. C.—Brown paper of great width and in continuous lengths, suitable for backgrounds, is generally kept by dealers in paper hangings.

ALEX. TAYLOR.—It is a somewhat difficult thing to say which is the best and simplest dry process, as there are so many which are both good and simple. The requirement of keeping well before and after exposure limits the choice somewhat. Perhaps the gum process, described in our last, will meet your requirements best in this respect. The coffee process is also a simple and good keeping process. The morphine process is very simple, and gives excellent results, but the plates do not keep well. Mr. England's process is simple, and gives fine results, and the plates will keep moderately well. All these are tolerably rapid; but the gum plates most so.

A. Z. II.—Unless there is some peculiarity or imperfection in your materials, the acetate bath should not tone too slowly at the expiration of twenty-four hours. We have frequently used one for weeks with advantage. Possibly your example of acetate of soda is alka-

line, which would account for your bath rapidly becoming inert. If it suit your convenience, however, and your bath work well a few hours after mixing, there is no reason whatever why you should not use it then.

J. KEENE.—Thanks for the charming Eburneum portraits; they are very excellent, and, when compared with the albuminized prints from the same negatives, admirably illustrate the superiority in delicacy and detail which pictures by this mode of printing possess over albuminized paper prints.

W. J. A. G.—The lenses of a binocular camera are generally placed from 2½ inches to 3 inches apart, the rule being that they should be at a similar distance as the human eyes, and when so placed they will give images producing a similar amount of relief to that seen by the human eyes. If they are placed at a greater distance they will give images which, in the stereoscope, have an exaggerated effect of relief, greater than could be seen by the human eyes; but that exaggerated effect of relief tends to dwarf the object, and make it look like a toy or model. If, for instance, you stand in front of a large building like St. Paul's, you can only see one side at a time; but if you stand at the same distance from a model of the building, only a foot in diameter say, you then may see all round it. So if you place your lenses in such a position that one sees one side and the other the other side of a large building, the stereoscopic picture produced will suggest the effect of a diminutive model. This is an old and much discussed question: the advocates of truth maintaining that the lenses should be in the same position as the human eyes; the advocates of startling effect recommending an increase in their separation for views and some other effects. The single lens camera you have has, we presume, the Latimer Clark's sliding parallel bars. The bars should be arranged for a ratio of convergence, so that they move through the arc of a circle of which the sitter or principal part of the subject is the centre. When properly adjusted, the sitter is focussed in its proper position on the ground glass, with the camera at one extremity; and when the bars are moved to the opposite extremity, the image will still be found to occupy the same place on the ground glass. Commence the exposure with the laths in a position which places the camera to the right-hand side, the slide carrying the plate also being at the right-hand end of the groove. After exposing, cover up the lens, move the laths to the left, and the slide carrying the plate to the left, and expose again. This will give you the images in their right position, needing no transposition.

SILEX.—We have never met with anything like fading in a carbon print. Some examples we have seen with a greenish tint from imperfect washing; but this has been the case as much when first produced as after long keeping. No doubt if an unframed carbon print be submitted to the heat of a hot sun it will cockle and curl, but this is a kind of treatment to which no work of art should be submitted. Destruction from an outward cause is altogether different from fading from internal or inherent causes.

Y. Z.—We saw the observations to which you refer, and we have also seen the old blocks in question, which, as you remark, appeared originally in an extinct journal; but the matter is not one of sufficient public interest for comment.

F. POWER.—Both will give perfectly straight lines, and both include a wide angle; but No. 1 is, we believe, the most rapid, and includes a little the widest angle.

L. M. D.—A slight washing only is necessary before toning; prolonged washing, or the use of salt and water, renders the toning more difficult, and the result is often wanting in richness. The chief disadvantage of toning without washing at all is that it causes an unnecessary waste of gold. Wash well after toning and before fixing. The grey tone and want of depth in the print enclosed are due to over-toning a print from a weak negative. In order to secure a rich deep black it is imperative that the negative be vigorous and the impression deeply printed.

B.—The chief reason of the simple albumen dry processes without collodion falling into disuse was not any lack of excellence in the results, so much as the necessity of great care in the preparation of the plates, the process being more troublesome than most of the dry collodion processes. M. Ferrier used albumen plates for his transparencies, but collodio-albumen for his negatives.

R. F.—The tendency in the albumen to crack when perfectly dessicated may be avoided by mounting the prints before they are thoroughly dry. Thanks.

C. D. V.—You cannot secure the copyright if copies have been sold before registration. 2. It is necessary to register a copy of each portrait which is in the slightest degree different from the others. 3. You cannot secure a copyright in the photograph of an old non-copyright engraving. Registration on your part will be no barrier to any one else copying the same engraving and selling copies of it. Several Correspondents in our next.

* * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

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CONTENTS.

	PAGE		PAGE
Expression in Portraiture	313	On the Reproduction of Engravings and Line Drawings. By	
Critical Notices	314	F. Fink	320
Echoes of the Month. By an Old Photographer	314	Detection of Hyposulphite. By M. Carey Lea.....	321
Foreign Miscellanea	315	Recent Patents	322
Pictorial Effect in Photography. By H. P. Robinson.....	316	Experiments with Filtering Papers	323
Photo-zincography in Practice. By J. Waterhouse, R.A.....	317	Correspondence—Carbonate of Lime in Toning	323
Mr. Piercy's Patent Method of Artistic Printing	318	Talk in the Studio	323
M. Carrier's Sensitive Paper	319	To Correspondents.....	324
The Coffee Process. By M. A. de Constant	320		

EXPRESSION IN PORTRAITURE.

IN the discussion which followed Mr. Pearce's excellent paper on Portraiture at a recent meeting of the South London Society, the Chairman deprecated the practice common amongst some photographers of requesting the sitter to fix his eyes on "a knob," rightly adding, that whilst there was nothing interesting in the knob, there was nothing reassuring in the adjuration to "keep quite still," which generally heralded the commencement of exposure. Mr. Blanchard suggested that a portraitist of judgment would, he thought, avoid both courses; he would merely request the eyes to be directed in a given direction, which seemed easy and natural for them, and he would carefully avoid startling the sitter by any stern injunction not to move. He would rather endeavour, by conversation, to interest the sitter, and when a pleasant expression was secured, would seize the opportunity of exposure, possibly requesting the sitter to maintain *that* expression and position for a few moments.

The management of the sitter in securing ease and naturalness is a thing which can scarcely be taught, as it depends more upon natural temperament and general culture than upon any rules which can be laid down; nevertheless it is a subject well worthy of the most careful study by all portraitists. A true and pleasing expression is the last and highest grace in any portrait, photographic or otherwise; most difficult to attain, and most prized when secured. Its presence will condone many technical shortcomings; its absence will often make the highest technical excellence valueless. In a painting, it is attributed to the skill of the artist; in a photograph, it is supposed to be due only to the sitter. In both cases it is, however, the result of combined action; the painter must see the expression before he can paint it; and, to see it, he must often, by interesting his sitter, elude it. The photographer must also see the expression before he can photograph it, and he must also often elude it before he can see it. The painter possesses, however, two special advantages over the photographer in this respect: he sees his sitter on several occasions, has opportunity for conversation and for studying his sitter, and, having once seen the face properly lit up with feeling—seen "the mind, the music breathing in the face"—he possesses the facility of transferring the fleeting expression to his canvas from memory. The photographer sees his sitter generally but once, and that once often for a few minutes only. Moreover, the camera has no memory, and can only fix the expression worn by the face during the moments of exposure. The desired expression must therefore be secured just at the critical moment, or it cannot appear in the photograph.

The hint thrown out by Mr. Howard, if practicable, might assist in giving the photographer some of the advantages

of the painter. He suggested that as technical difficulties had, to a great extent, been mastered by professional portraitists, and higher demands were made by the public than in the infancy of the art, he thought a higher standard, involving more time, greater ability, and more cost, might, without impropriety, be aimed at by first-class portraitists; that instead of taking each sitter just when he came to sit and with the hasty estimate of the best effect for each portrait which could be found in one often hurried sitting, the photographer should have a previous interview with his sitter, in which he could form a deliberate idea of the result most desirable, and some degree of acquaintance or familiarity—or, at least, mutual confidence—between the artist and his sitter be established. Of course, to render such opportunity for previous thought and arrangement of any avail, the photographer must be, in some degree, master of the difficult art of portraiture; but with an understanding of its requirements there can be little doubt that such a course would conduce to the production of higher results; and the suggestion is worth the consideration of portraitists who aim at the highest results, and can command the terms which would be remunerative for the expenditure of the time and consideration necessary for carrying out such a project.

The possibility of securing the portrait whilst the sitter was unconscious of the ideal has often been desiderated by nervous persons, and has generally been regarded as an unpractical thing. It is, however, not altogether impossible. A lady recently sitting to Mr. Robinson expressed considerable apprehension as to the possibility of preserving a natural expression when the moment of exposure came. She had been requested to rest herself without any concern on that head until the preparations were made; and when, a short time afterwards, she exclaimed, "If you could only take me when I didn't know it, I am sure the result would be better," the answer returned was, "Madam, I have obtained four portraits of you already!" some of which were, to her great delight, in every way satisfactory. She had been placed at the outset, with little fuss and circumstance, in an easy, quiet position, and, the light being good and chemicals working well, the four portraits were secured whilst she imagined that the photographer was merely arranging his camera. We have seen Mons. Adam-Salomon effect a similar result. Having duly arranged the sitter, who was requested to remain tranquil, and not speak for a few moments, he continued the conversation, to which the sitter listened with a look of interest, expecting to be informed in a few moments that the exposure would commence, only to be informed that it was over. To attain results of this kind it is scarcely necessary to say that the photographer must study something more than photographic processes, and that, whilst his technical conditions should be perfect, his knowledge of human nature, and of portraiture as an art, must be sedulously cultivated.

Critical Notices.

A MANUAL OF PHOTOGRAPHIC MANIPULATION;
Treating of the Practice of the Art, and its Various Applications to Nature. By LAKE PRICE. Second Edition.
(London: John Churchill and Sons.)

THE name of Mr. Lake Price is known to photographers throughout the world as associated with some of the earliest and most successful triumphs of photography in the domain of fine art. His recognized position in the art world silenced cavil when he put forth the noble productions of his camera, and proved to doubters that photography was capable, in the hands of an artist, of rendering a wide range of pictorial effects. His work also illustrated in a high degree the happy combination of great practical and technical skill with artistic culture; hence, when he gave to the photographic public a manual of instructions, it was eagerly read, and, in natural course, passed out of print. When a book of interest is out of print, it is generally quickly reprinted; but a mere reprint of a work relating to a growing art like photography is comparatively useless. The constant change and modification going forward must be noted, to give a manual of instruction value. Unfortunately, the changes in some phases of the art were not—or, at any rate, did not seem to Mr. Price—improvements. The race for cheapness rather than excellence set in, and he retired from the active pursuit of the art with something like disgust.

It rarely happens, however, when a man has attained the mastery over an art which Mr. Lake Price had attained over photography, that he can entirely abandon it or lose interest in it. Mr. Price has watched the course of events, and has for some time past been renewing his intimate acquaintance with the art, and has been induced, as a result, to partly rewrite, revise, and issue a new edition of his work, first published ten years ago, and the result is now before us.

A glance over the pages of the new edition just issued will satisfy the reader that although the author has ceased for the last few years to publish the productions of his camera, photography must necessarily have secured a full share of his attention, as all subjects both of current and permanent interest belonging to the pages of a manual are fully and freshly treated. All the important novelties in the optical appliances are fully and practically considered, the chapter on lenses being most valuable and exhaustive, the result of careful examination and trial of the various new instruments introduced during the last few years. The series of chapters devoted to "Subjects: their Nature and Treatment," will perhaps be read by experienced photographers with the most profit and interest, and will be found to abound with the suggestions of ripe culture and art experience. The demands upon our time and space preclude our giving a fuller notice of the work, or extracts from its pages; to which we shall, however, shortly recur. We conclude by adding, that in addition to all the subjects included in the former edition, carbon printing, astronomical photography, microscopic photography, are here fully treated, the present work containing about fifty more pages than are found in the first edition.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

PROGRESS OF CARBON PRINTING—NORTH LONDON PRESENTATION PRINT COMPETITION—IMPRISONMENT FOR PIRACY—PHOTOGRAPHY AND LIBEL—MR. LAKE PRICE'S "PHOTOGRAPHIC MANIPULATIONS"—ENLARGEMENTS AND PORTABLE FIELD APPARATUS—THE STEREOSCOPES.

It is very gratifying to all who care for the progress of permanent photography to see the increasing interest which prevails in the carbon process, both in the outside world and in special photographic circles. Since the publication of

Mr. Wharton Simpson's work on carbon printing, not many months ago, three others have been issued, of which I have seen copies: a translation into German, by Dr. Vogel, with a capital carbon print as illustration; another in German, a small compilation, by Dr. Liesegang; and an American edition, by Mr. Wilson, which, as stated, is chiefly based on Mr. Simpson's work (this also has a carbon print illustration). The argument I derive from the publication of these works is, that there is a demand for them, and that the process they describe is exciting wide-spread interest.

In France I see that various papers are communicated to the Society, chiefly on what are modifications of Swan's process; but as a rule I have not been able to perceive in what the modification consists. M. Jeanreudand's paper, for instance, appeared to be simply a statement of Mr. Swan's method. M. Marion has been working lately with praiseworthy energy in experimenting with carbon with his new pellicle (now acknowledged to be collodion, and not caoutchouc); but does not his method simply amount to the same thing as Mr. Swan's first method, when he prepared his tissue upon collodion instead of paper? The suggestion of Mr. Taylor, of Marseilles, for removing the yellow tint from the back of paper tissue, and so rendering printing through the tissue itself, appears to be a valuable suggestion for purposes in which extreme delicacy is required. If I remember aright, Mr. Swan once made a still better suggestion, which I have never heard of any one carrying out. I refer to the mode of making a tissue upon paper made transparent with oil or varnish, printing through the transparent paper, and when the operation of exposure, development, &c., were all complete, floating the print on a solvent of the oil or varnish to remove it, and so restore the paper upon which the print is formed to its opacity and whiteness, necessary to give it any value as a picture. Possibly, however, the now recognized method of carbon printing would give better results with less trouble.

The idea of the North London Society, of submitting the production of the presentation print to competition, is, I think, a very happy one. It gives an opportunity of bringing forward something specially good to all interested in securing honours, for it is an honour to supply the presentation prints to any society, especially when the selection must be made from the works of various competitors. And it will in all probability secure the members something more original than they might otherwise have secured, although, perhaps, it may be difficult to surpass, either in novelty or excellence, some of the pictures distributed within the last year or two to the members.

I am glad to see that a pirate cannot evade the payment of his fine by becoming bankrupt. If that had been found possible, the class of persons who systematically execute or vend piracies would, whenever heavy fines were inflicted, have found Basinghall Street a short cut from gaol. The fine inflicted is, as Lord Justice Wood has ruled, a punishment for criminal offence, and not an estimated amount of damage to be regarded as a debt to the person whose copyright is infringed. This decision may perchance press hardly upon the ignorant offender or the person led into the commission of an offence by the machinations of a spy or informer; but the fines can only be heavy where the transactions are large, and this can rarely be the case without the persons engaged in the guilty traffic having some notion of its illegality.

Photography of late years seems generally to take some part in the progress of almost all *causes celebres*, and I notice that photographs of documentary evidence were admitted in Court in the course of the action of Risk Allah against the *Daily Telegraph*. According to rumour, photography was to have entered more intimately into a succeeding case, which was, however, apparently withdrawn or compromised, as it did not come to trial. The Stereoscopic Company, it appears, exhibited during the trial, at Brussels, a portrait of Risk Allah, with a description appended, stating that he was

charged with the murder. The intended action was on the ground that the picture was exhibited with this description appended for some days after a verdict of acquittal was rendered. It is, perhaps, worth while for photographers to take a hint from this, and shun the risk involved, which might be so innocently and thoughtlessly incurred.

The issue of a new edition of Mr. Lake Price's "Photographic Manipulations" during the last few days is worth noting. The return of Mr. Price to an early love, after a long—not estrangement, but—pursuit of other interests, will be hailed with pleasure by photographers, and the advent of the new edition of his work, rewritten and enlarged, will be greeted with welcome, and I, for one, shall look forward to renewed triumphs in the phases of art-photography which were years ago adored by Mr. Price's works.

The question of producing small negatives with a view to the subsequent production of either an enlarged negative or enlarged prints—a question full of interest to the amateur photographer—has scarcely, I think, received sufficient attention yet amongst photographers. There are very few indeed, I fancy, who would not prefer to work the wet process to the dry process, if it were not for the serious difficulty imposed by carrying dark tents, manipulating boxes, &c. Now, if it were once determined that really good results could be obtained by the means of enlargement from small negatives, more than half the troubles of impedimenta might be made to vanish. Enlargements in portraiture in various manners have, of course, been tried, and found successful, especially when the work has been intended for retouching or colouring; but, as yet, the question of enlarging without the necessity of retouching, as applied to landscape photography, has not been very thoroughly or very fairly tried. I do not suppose that many of the schemes for producing negatives the size of postage stamps will ever receive serious attention; but I think that if negatives of about $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches were carefully produced, fine 12 by 10 pictures might be obtained from them. For such a purpose, the little apparatus referred to by Mr. Barrett in the *Photographic News* of last week, and described in a former volume, would be found by far the best of any contrivance hitherto proposed. Some years ago I had an opportunity, availing myself of Mr. Barrett's courtesy, of examining the equipment, and I was much struck with its ingenuity and convenience. A plate coated with collodion is immersed into the silver bath, and at once enveloped in a light-tight cover, from which it never emerges until it is a finished negative of about the size I have mentioned. The whole apparatus is scarcely larger than a man's hat; it is apparently very easy to work, and it certainly admits of the production of good results. How is it, I wonder, that such a piece of apparatus has never come into commerce?

The societies generally have brought their sittings to a close. Dr. Mann gave an interesting account of Professor Piazzi Smyth's operations in the Great Pyramid with an apparatus of a similar kind to Mr. Barrett's just mentioned; but in many respects not equal, I think, to the latter. Mr. Dunmore exhibited a tent which was undoubtedly convenient to work in; being intended for large plates, it was, however, necessarily a somewhat cumbersome affair to move about and erect. At the North London very little was done, except some society business. The South London Society had a capital meeting, at which, besides the election of officers, reading of a report, and transaction of the general business of an annual meeting, a suggestive and well-written paper was read by Mr. Pearce, and an interesting discussion followed. The proceedings terminated by an arrangement for an out-door meeting at Hampton Court, and an invitation to the members from the genial and large-hearted President to spend an evening at his house.

At the Manchester Society Mr. Mabley read some observations on print-washing apparatus, which originated an interesting discussion, in which short washing, with specific treatment, such as pressing, rubbing, &c., to remove

the hypo, was generally regarded as much more conducive to permanency than any mode in which merely prolonged soaking was relied on. At Oldham a pleasant out-door meeting was held, which gave general satisfaction to the members.

Foreign Miscellanea.

FOLLOWING the example set by the Duc de Luynes, M. Frederich von Voigtländer has recently placed at the disposal of the Viennese Photographic Society the sum of four thousand five hundred florins (about £450), to be employed in encouraging the working out of improvements in the art of photography. According to the conditions drawn up to regulate the manner in which this sum of money is to be used, it is stated that the interest of the capital only will be expended, the principal being invested in the Austrian funds. A jury or prize committee is to be formed, composed of members of the society, and these will adjudge prizes, consisting either of medals or grants of money, to the more deserving candidates at a competitive meeting to be held annually. All works sent in to compete are not to bear the name of the artist, but must be marked with a symbol or device and accompanied by a sealed letter from the sender bearing on the outside a similar design; the candidates must be members of the Photographic Society of Vienna, but need not be resident in that city. In the case of the society ceasing to exist the money will revert to the donor or his successors.

In the *Mittheilungen* M. Grasshoff contributes a very clever paper on photographic backgrounds. He complains loudly of the manner in which some of the cabinet pictures are overloaded with accessories, stating that it sometimes appears quite wonderful how the sitter could have threaded himself through the mass of furniture and nicknaws with which he is surrounded, and which encumber and hem him in on all sides; the majority of backgrounds are, likewise, too highly coloured, and the perspective details generally too distinctly marked to appear natural. Scenic effects which give good results in one studio are sometimes found to be quite unserviceable in others, owing to the different lighting arrangements; and M. Grasshoff recommends, therefore, a final touching up and modification of the background when in position. To render portions of the background more brilliant, and to light up any dull points, a little powdered chalk will be found very efficacious; and, on the contrary, a glaring surface may be subdued by treating it with dry powdered ochre or umber.

In reference to the photographic establishment of M. Braun, of Dornach, the beauty of whose carbon printing is so well known, the *Photographisches Archiv* states that as many as seventy employes are engaged on the premises. The grinding and mixing of the pigments, as, likewise, the sensitizing and rolling of the carbon material, is performed by machinery, a six-horse power steam-engine being used for the purpose, and the benzole vapour from the transferred prints is dissipated by means of a windmill which makes twelve hundred revolutions in a minute. As many as four hundred 20 by 15-inch pictures are turned out every day, and this number will shortly be increased to five or six hundred. The *Archiv* states that the quality of the work performed is, on the whole, very good, but it is of opinion that the pictures produced by Swan, at Newcastle, are more brilliant and of a finer and better tone than those turned out at the Braun establishment; at the same time it should be remembered that M. Braun has had less experience in the process, and that he works on a very large scale.

A new process, says the *Archiv*, has been elaborated by M. Woithly, consisting in the use of urano-nickel collodion. The pictures produced by it are perfect as regards definition and clearness, and their tone is excellent. The details of the process have not yet been published by M. Woithly.

M. Tessié du Motay, a gentleman well known as a photographer and photo-lithographer, has discovered an easy and cheap method of obtaining oxygen, which is now being employed for furnishing gas for some oxy-hydrogen lime lights now under trial at Paris. Four candelabra have been erected upon the square in front of the Hotel de Ville for the purpose of thoroughly testing this mode of illumination. M. du Motay produces his oxygen at the rate of sevenpence per cubic yard; by passing a current of hot air over manganate of potash he converts that material into permanganate, from which the oxygen is readily generated by treatment with super heated steam.

M. Geymet recently calls attention in the *Moniteur de la Photographie* to the fact that he is able to prepare for commercial purposes the transparent sensitive film upon which, as he some time ago stated, photographic impressions may be printed, and afterwards transferred to a suitable support. The mode employed appeared to be a modification of the collodio-chloride process. The latter may consist of coloured paper, or of a leaf of metal—as, for instance, of gold or silver; and inasmuch as the photograph itself is perfectly transparent, even in the deepest shadows, a very pleasing result may thus be obtained, provided the nature or colour of the support is in keeping with the character of the picture.

M. A. de Constant writes to the *Archiv* in warm praise of Steinheil's new aplanatic lens for groups and landscape pictures. He has been able by its means to secure good results with coffee dry plates, with an exposure of from 12 to 15 seconds only, the plates being at the time a week or ten days old; the soft outlines of mountains twelve miles distant, as likewise the details of the foreground, are equally well rendered by the lens.

M. Dnbost, of Düsseldorf, has been very successful in the production of excellent negatives by the coffee process; they are both brilliant and harmonious, and developed by means of an acid solution, made up according to the following formula:—

No. 1.—Water	...	...	...	100 parts
Pyrogallie acid	...	...	...	1 part
Citric acid	...	...	...	$\frac{1}{4}$ "
No. 2.—Water	...	...	...	100 parts
Nitrate of silver...	...	...	...	6 "
Citric acid	...	...	...	6 "

The solutions are mixed together for use.

PICTORIAL EFFECT IN PHOTOGRAPHY ;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXIII.

"Fit it with such furniture as suits

The greatness of his person."

Shakespeare.

"It shall be so my care

To have you royally appointed, as if

The scene you play were mine."

Shakespeare.

BACKGROUNDS AND ACCESSORIES.

PERHAPS in no other one part of their art have photographers so outraged nature as in the choice of accessories and the make-up of their pictures.

Let me turn over the leaves of an album, and describe one or two of the pictures contained therein.

No. 1. A portrait of a lady in an evening dress, walking on the sea-shore; in consideration of her thin shoes, that part of the sands on which she is standing is carpeted.

No. 2 represents a veteran photographer standing on a terrace. The terrace is carpeted, and on it stand a pedestal and column, round which is festooned a curtain elaborately tied up in various places with cord and enormous tassels. The distant landscape is delicately and well done, but adds force to the absurdity of the curtain in the open air.

No. 3. A gentleman standing before a profile balustrade and pillar, with landscape behind representing distant mountains. The light on the figure is from the right, that on the balustrade from the left. The shadow of the column falls on the distant mountains, which are much more clearly defined than the head of the figure.

No. 4. A lady reading at a window, but the light comes from the opposite direction. The shadow of the window-curtain falls on the sky.

No. 5 represents a gentleman with a gas chandelier, globes and all, sprouting out of the top of his head.

There are one hundred pictures in the book, many of them from the most popular studios. There is a column or balustrade in seventy-eight of these cartes. And yet photographers accurately represent nature!

A curtain is allowable because it is possible, but the use of the column is open to very grave doubt, and the two together are so exceedingly improbable as to be almost absurd. It is true, the employment of these accessories as a background is to be found in the pictures of some great painters, but the tricks of one art may not be applicable to another. The column and curtain are conventional. Now conventionalities may be right in an art like painting, where a good deal of license has been allowed, and has become sanctioned by custom, but photography is a new art, the results of which are taken direct from nature, and is without precedents. It is an art in which departure from truth becomes absurd. We, the workers in the first quarter century of its existence, are the makers of precedents: let us be careful, then, that they are not misleading and dangerous ones.

Photography is the most imitative of all the arts, and photographers the greatest imitators, as they have shown by the way they have followed and adopted much that is bad in painters; and perhaps the worst of these imitations has been this column-and-curtain conventionality for most of their sitters, when it is probable that few under the rank of those who dwell in palaces ever naturally have the opportunity of being in the neighbourhood of such accessories. In painted pictures the column is shown with some chance of possibility, but the way it has been used in photography has been ridiculous and absurd, it generally being placed on a carpet. Now everybody must be open to the conviction that marble or stone pillars are not built on carpets or oil-cloth for a foundation. But there was a lower depth. Wooden columns were not bad enough, nor cheap enough, so recourse was had to imitations of these sham pillars manufactured out of flat boards and canvas, and painted in perspective that looked every way for the point of sight without being ever able to discover it; if any of the lines were right, it was on the principle that makes a clock that does not go, right at one second of the day at least. The violent light is often represented as coming from the opposite direction to that which illuminated the figure. Then, by a stroke of genius, somebody extended the application of these profile slips to the representation of other objects, such as chairs, on which, being flat, it was impossible to sit down, pianofortes, fireplaces, French windows, and everything that was capable of being caricatured in this manner. But the "crowning glory" of this kind of sham furniture was the *multum in parvo*, or "universal," that Protean construction which was at one minute a pianoforte and at another a bookcase—a sort of economical houseful of furniture in one piece. This was certainly an improvement on the slips, and if manufacturers would only add a little taste to their cabinet work, suppress the rococo ornamentation, and make them much plainer, they may be of use where the very best work is not necessary.

But if the photographer has any pride in his art, if he desires to do the best that can be done, he must eschew imitations, and have nothing in his studio but genuine furniture of the best kind, and of good design and character. When the photographer is furnishing, he would find it a good plan to fit up, not only his studio, but his reception rooms also, with chairs of different patterns—a "Harlequin Set,"

as collectors of old china would call it—so that he may be able to make a constant variety in his pictures. He would do well to avoid the elaborately carved, high-backed chairs, so constantly seen in photography and seldom anywhere else, the high back often sticking out round the head like a Gothic glory: if this chair is used at all, it should be so arranged that the head of the sitter is quite clear of it. Dining-room and library chairs are always useful, so also is that kind of chair to which the name of *Prie-Dieu* is given, especially for standing figures. It is very difficult to meet with a good arm-chair suitable for photographic purposes. The chairs of the present day are made more for comfort than appearance, and are so low that the sitter is dwarfed and foreshortened. It would pay manufacturers to employ a good designer to supply them with patterns and make them for the profession.

After chairs naturally follow tables. It is scarcely necessary to say anything against the little round table, about twelve or fourteen inches in diameter, to be seen in many early photographic portraits, the use of which is now gone out, except in the smallest and lowest glass sheds. The furniture in a picture should give an idea that there is space in the room; this is not done when a small table is employed, obviously because there is no room for a larger one. A long, oval table, about 3 feet 6 inches by 1 foot 6 inches, is a very useful size and shape; it should be made light and upon large castors, that it may be easily moved. This should be provided with one or two good covers of a quiet pattern. In a table-cover, as in the covers of chairs and cushions, violent and "noisy" designs should be avoided. As a change from the plain table, a more elaborate carved oak table may be admitted for occasional use, and so may a judiciously selected cabinet, but it must be always remembered, in introducing these necessities, that it is the portrait of the sitter that is required, and which must be most prominent, and not the magnificence of the fittings of the studio, which may be "richly suited, but unsuitable."

Some photographers employ a table which can be raised or lowered, to suit the stature of the sitter, by means of rackwork. This, in the hands of a photographer of great judgment, may be a very useful accessory, but it is a power that should be employed very sparingly and within very narrow limits. If it were raised too high it would dwarf the figure by comparison, or, in the reverse case, by screwing it down too low, it would transform the sitter into a giant, reminding us of the *carte-de-visite* of the short man whom *Punch* represented as having his portrait taken surrounded by toy furniture. The same principle has also been applied to the pedestal and column.

The great idea of many photographers, in taking standing figures, seems to have been that they must have something to lean upon (could the idea have originated in the supposition that some support was necessary after the toilsome ascent to their studios in the sky parlours?), and, therefore, the want was supplied by a pedestal that outraged nature, as I have already said, most abominably. It is not necessary to an easy and graceful effect that the figure should appear to be too tired to stand on its own feet. Lounging is no more graceful than is a lisping and insipid manner of speaking gracious, but tends more to what Sir Joshua Reynolds called the most hateful of all hateful qualities, affectation. If people look well in a standing position at all (which some certainly do not, and should never be taken so), they will be found to do so without the aid of a prop; but still, for the sake of variety, and because some people have been so often taken with a support that it has become a custom with them from which they do not like to depart, it is as well to have something of the sort at hand. The best piece of furniture of the kind is a cabinet. A low bookcase is not objectionable, neither would be a well-designed what-not, but the ugly, meaningless pedestal should never be used. I should consider I was doing a great service to the art progress of photography if I could induce all photographers who have columns and pedestals

to burn them at once. Don't send them to the broker; he may sell them again to do further mischief.

A few low ottomans and footstools should always form part of the furniture of the studio. They are especially useful in grouping children. The carpet of the room should be of a small, neat pattern, and contain no great contrasts of dark and light.

A great deal can be done and very beautiful pictures made by the mixture of the real and artificial in a picture. Although, for choice, I should prefer everything in a photograph being from nature, I admit a picture to be right when the "effect" is natural, however obtained.* It is not the truth of reality that is required, but the truth of imitation that constitutes a veracious picture. Cultivated minds do not require to believe that they are deceived and that they look on actual nature when they behold a pictorial representation of it. An educated observer does not, like that Moor to whom Bruce, the African traveller, gave the picture of a fish, believe that the artist had made a reality, and say: "If this fish at the last day should rise against you and say, 'Thou hast given me a body, but not a living soul,'—what should you reply?" Art is not the science of deception, but that of giving pleasure, the word pleasure being used in its purest and loftiest sense. For this purpose—that is, the mixture of the real with the artificial—the accessories of the studio should receive the addition of picturesque or ivy-covered logs of wood, ferns, tufts of grass, &c., either growing in low pots or gathered fresh. It will be found easy to make up picturesque foregrounds with these materials, behind which a painted view or sky may be placed. If the background be well painted it will be found to unite very naturally with the foreground. Care must be taken that linear perspective be avoided, and that the light fall on the figures in the same direction as it does on the painted screen.

PHOTO-ZINCOGRAPHY IN PRACTICE.†

BY J. WATERHOUSE, R.A.

PREPARATION OF THE ZINC PLATES FOR RECEIVING TRANSFERS.

The zinc used for this purpose comes from Silesia. It is supplied in rolled sheets of different sizes and thicknesses; the price is about two shillings a square foot, varying slightly according to the gauge. The gauges in general use for photo-zincography are from 7 to 11 Birmingham wire gauge, or 3-tenths to 1-eighth of an inch. Plates of any size are supplied by Messrs. Hughes and Kimber, at 2s. a square foot, ready for graining, or grained at 2s. 9d. the square foot. It will be most convenient for the amateur to purchase his plates ready grained; but as some may prefer buying them in a rough state, I will describe the whole process of preparing the plates. The zinc plates, when received from the makers, are rough and full of hollows and other blemishes, which render the plates unfit for use till one side has been made perfectly smooth and has received an even graining with fine sand, which covers the surface with sharp, fine, uniform grains or asperities, and thus increases its affinity for the greasy ink or crayon, and renders the surface as capable of retaining moisture as the lithographic stone.

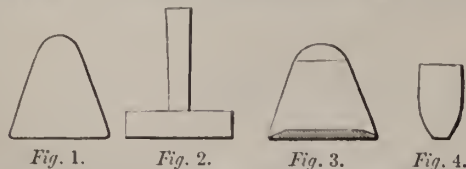
The first operation is to take off the sharp edges of the plates. The plate is fixed down by weights or clamps to a table, the edges are scraped down in succession with a tool resembling a spoke-shave; when the sharpness has been taken off all round the plate on both sides, the edges are smoothed with a rasp, and the corners of the plate are rounded off. It should now be examined on both sides, and the best side marked; it is then heated in the sun or before a fire, to render the metal more pliable, and passed three or four times through the copper-plate press, under full pressure. During this process the plate becomes bent, and care must be taken to roll the plate the last time with the best

* For other reasons why, see chap. xii.

† Continued from p. 307.

side downwards. The plate is then placed, face upwards, on a table, and the surface is scraped with a razor-blade inserted in a groove in one end of a flat wooden handle. To make this tool, take an ordinary razor, break off the tang, and fix the blade into the groove in the handle; sharpen it by grinding it vertically on an oil-stone; by this means the blade receives two scraping edges, both of which may be used before re-sharpening. This tool is held with both hands, thumbs in front, pointing up. The plate is scraped evenly all over in parallel lines till all the inequalities have been taken off and the surface appears tolerably smooth and bright all over. It is then examined for holes and other serious flaws, which must be hammered out. The position of the hole is marked on the back of the plate by means of a pair of callipers, which may be made of a strip of hoop-iron with a hole at each end, and doubled so that the hole corresponds exactly one over the other. One hole is placed over the flaw, and a mark made on the back of the plate through the other hole. The plate is then laid, face downwards, on a very smooth steel anvil, and the back of the plate is hammered at the spot indicated by the pencil-mark till the face is perfectly smooth and the flaw removed. The hammer-head has a flat face at one end, and is round at the other; the anvil is of steel, about 4 inches in diameter, and is fixed into a strong wooden block. They are to be obtained at the tool shops where engravers' tools are sold.

The scraping is continued till the surface is uniform. The plate is then removed to the graining-trough and rubbed with pumice-stone lengthwise and crosswise in parallel lines till it is perfectly smooth. The pumice should not be too hard, or it will cut deep scratches in the plate, which will be removed with difficulty. The softer it is the better; if it works gritty, which can easily be felt, the plate should be washed and the pumice cleaned with water. When the plate is quite smooth, and all furrows and markings have disappeared, it is smoothed with Water-of-Ayrstone, or, as it is commonly called, snake-stone. This is worked in the same way as the pumice-stone, the plate being occasionally washed with water. When the plate is quite smooth, bright, and free from scratches, it is fit for graining, which is done by sprinkling fine graining-sand upon the plate, with enough water to moisten it, and working it with a zinc muller round and round with a slow, consecutive, rotary motion, in *small circles*, up and down and across the plate in every direction, till the surface appears of an uniform dark grey tint. The sand used for this purpose is the soft, yellow, loamy sand called brassfounders' moulding sand. Silver sand is not suitable for this purpose; it is too hard, and liable to scratch the plate. Before use it should be carefully sifted through brass-wire sieves varying in fineness according to the effect required: for common work sieves containing from 80 to 120 holes to the linear inch may be used; for close, fine work, 140 holes; and for half-tones, where a very fine grain is required, 160 holes. It can be bought ready sifted, of different degrees of fineness, and may be preserved in bottles with a small hole in the cork. The mullers are of different shapes, but it is essential that the sharp edges should be rounded off with a file. There are three kinds of mullers in use, as shown in the annexed diagrams. Fig. 1 is a solid,



conical mass of zinc, with a base of about 4 inches diameter; fig. 2 is a disc of zinc 4 inches diameter, 2 inches thick, fastened to a wooden or iron handle. To cast them, a mould is made in sand, the iron handle is suspended over the centre of the mould with a piece of string, the melted zinc is then poured in, and, when cold, is faced and turned in a lathe.

No. 3 is a simple and cheap form; it consists of a large bung, on the base of which a square piece of sheet zinc is laid, the sides turned over and pressed towards the circumference of the bung. The corners are cut away and turned up. Owing to slight inequalities there frequently remain strips or patches on the plate which are not granulated; these should be worked with small mullers, as fig. 4. While graining the greatest care must be taken to avoid getting any grit on the plate. The mullers should be carefully washed before use, and while in use should not be put down on their faces or where any grit or dirt may attach itself to them. When the sand first applied has become too fine, and is of a dark slate colour, it should be washed off, and fresh sand applied. In the course of from half an hour to two hours the plate should appear of an uniform grey colour, finely granulated, and may be considered ready for use; it is well washed with water and a soft flannel kept for the purpose, till all traces of the sand are removed, and then turned up on its edge to drain. Hot water is then poured over the back of the plate, so that the face may dry as quickly and evenly as possible. The plate is then carefully stowed away in a dry place till required for use. The greatest care must be taken not to touch grained plates with the fingers, and to keep them from anything greasy. A plate is in its best condition when first prepared; by keeping it gradually deteriorates, and should not be used after it has been kept a fortnight.

TREATMENT OF ZINC PLATES WHICH HAVE RECEIVED TRANSFERS.

The zinc plates can be regrained, and used over and over again, without any sensible diminution of thickness. The regaining is a very simple operation, and not so troublesome as the first preparation of the plates. If the plate to be regained is "gummed up"—that is, covered with gum to preserve it—wash off the gum, remove the ink with turpentine, wash clean with water, and apply the

Alkaline Solution.

Potash	...	...	...	...	4 pounds
Quicklime	...	...	...	...	4 "
Water	...	...	...	...	6 gallons

A strong solution of common potash will answer. The object of this is to destroy the grease in the ink. Wash well with water, and with a flannel rubber apply an acid solution:—

Water	...	...	...	...	2 ounces
Sulphuric acid	...	...	...	...	2 drachms
Muriatic acid	...	...	...	...	2 "

Let this remain for a few minutes, and then wash well with water. This should be done in the open air, as the fumes arising are very unpleasant. The plate is then treated and grained as before described.

(To be continued.)

MR. PIERCY'S PATENT METHOD OF ARTISTIC PRINTING.

WE recently noticed some very fine examples of artistic printing by Mr. Frederic Piercy, a gentleman well known in art circles as a skilful painter. We subjoin the specification of the method whereby the results are obtained. The application of lithography to photographs, as our readers know, is not new; the novelty here consists in the mode of regulating the tint, and giving it a certain amount of pictorial gradation, by removing portions from the stone or plate before printing; in the mode of obtaining texture and modelling by manipulating on the applied tint with bread or india-rubber; and of obtaining sharp lights by burnishing at the back of the tracing or print placed on the inked stone previous to printing the tint on the photograph to be treated.

The effect obtained by working on and graduating the delicate grey ink which is applied to the photograph gene-

rally is singularly pleasing, producing a quality of texture we have not seen produced by other means, and in large pictures is exceedingly valuable. The specification is as follows:—

My invention relates to a process whereby new effects in portrait, landscape, and other subjects are attained which may be used in connection with and as an aid to photography, lithography, plate and wood block printing, and in some cases alone, or to give permanence to photographs.

The process by which these effects are obtained is as follows:—An outline of the photograph, drawing, or print to be treated is traced on the back thereof, or on a sheet of paper. The picture and paper are placed together on a lithographic stone, wood block, copper, or other plate having on its surface or in the mezzotint, aquatint, machine tint, or other ground, the colour the whole or portion of which it is desired to transfer to the picture; said picture is placed with its face downwards, having the sheet of paper intervening between it and the stone or plate, then, by rubbing, pressure, and burnishing those parts in the tracing corresponding to the parts required to be left light in the picture, the colour on the stone, block, or plate will be transferred to the sheet of paper intervening between the picture and the stone or plate wherever the pressure or burnishing is applied. If the traced outline has been made on the sheet of intervening paper the picture must be removed, and registering points used or held so that it can be returned to the exact position it first occupied, the rubbing and burnishing process being applied to the tracing as before, but to the sheet of paper instead of to the back of the picture: for example, if the general colour of a face or sky is required lighter than the rest of the picture, the surface occupied by the tracing of the face or sky is rubbed or stumped so that a portion of the colour on the stone or plate corresponding to the tracing may be transferred to the sheet of paper. The high and secondary lights are obtained by burnishing those parts of the tracing which represent the proper position of the required lights, removing the colour from the stone, plate, or block in those parts. By a careful use of the burnisher or pencil used, lights may be obtained of varied character, either graduated or sudden and sharp. Sheets of paper, cloth, or other fabric to which the colour is transferred, may be used of different textures for different parts of the same picture according to the effects required. In certain cases I prefer to protect the photograph or other subject by means of gum or chalk to serve as the intervening material on those parts which I wish to be light, the protecting substance or substances being removed by washing or friction after the operation of printing. When as much of the colour is removed from the stone as desired, the sheet of paper is taken away, leaving the stone exposed, when the colour may be still further removed by means of bread or otherwise. The picture is then laid, face downwards, in its proper position on the stone, and passed through the press; when the picture is removed from the press, and while the ink is still wet and manageable, the effect is heightened and refined by means of bread, or an effect may be wholly obtained by the application of bread to wet or partially dry printing ink. When the photograph is printed on albuminized paper it will be found useful to use a knife or mezzotint scraper to obtain sharp and other lights, and this without disturbing the surface of the paper or albumen. This process may be repeated as often as required, various colours and shades of colour being added at will; as, for instance, the colour of the hair or face may be printed on the picture, for if the stone or plate be charged with a flesh tint, and the colour transferred to the intervening paper or cloth in those parts where it is not required, the picture will consequently, when printed, be left uncoloured in those parts. In colouring photographs I may also use a tint engraved on a plate or block, the parts to be coloured being indicated by tracing on the plate, when the appropriate colour is filled into those parts of the engraved tint, which may then be printed on the photograph with an engraved surface; the effect on photographs may be further modified by "wiping close" those parts required light in the photograph. In order to colour numerous copies of the same picture without the repeated use of the sheet of transferring paper, the colour may be permanently removed by scraping out or biting away by means of acid the light parts on the stone, or by burnishing and scraping when a plate is employed, which effects are then to be completed by the application of bread to the wet or partially wet ink.

My invention further consists in the use of a glass plate, the

surface of which is finely ground to receive a tint similar to that obtained in lithographic printing; or the glass plate may be machine-ruled to receive a tint, when, by placing the picture behind the glass, the effects before described may be obtained with increased facility, and printed on the picture from the glass plate.

My invention also consists in transmitting rays through a lens from the object to be coloured on to a lithographic or engraved tint, or on to the paper covering that tint, by which I am enabled to place in proper position on the stone or plate the colours which are to be printed on the picture, or to remove colour in those parts required light when printed. In the case of photographs the rays would be transmitted through the lens from the negative. By the application of oil colour to photographic and other pictures their permanence is increased, the coating of oil colour forming a protection against atmospheric and other injurious influences. When applied to photographs the soda used in fixing the prints is neutralized and fixed by the coating of oil colour. A ground may also be obtained with oil colour upon which to work with pencil, chalk, and crayons, or to paint with oil or water colours, and this ground I print on the paper either before or after printing the photograph. If the ground is printed before the photograph the high lights and gradations must be obtained as before described, and the tint used must be one which will not be injuriously affected by the chemicals employed in photographic printing; as, for instance, the combination of black, indian red, and ultramarine, will produce such a tint. Where a carbon printed photograph is to be transferred to a ground work, and effect produced by my process, this, of course, is not essential. Pencil and other sketches may also be let by my process, and have lights and skies readily introduced. Pictures on porcelain may either be wholly or partially printed by my process, and then burnt in as usual. It will also be found useful to charge albuminized or other paper with printing ink, and to obtain effects by the means already described, and then, by the use of a press, or by burnishing, to transfer the colour to the photograph or other work of art, by which means various colours may be applied, and a very delicate effect produced. In photography a print the reverse of the one to be treated may be used, when all the parts may be tinted in this way at leisure and with the greatest precision, while the application of bread to the wet ink will be found to give effects of the greatest value.

Having described the nature of my invention, and the manner of performing the same, I declare that what I claim as my invention to be protected by the herein-before in part recited letters patent is,—

First. Tinting or colouring photographs, engravings, water colour and other drawings, or porcelain, by the several means and processes herein described.

Secondly. I claim the use in the above processes of an intervening material or materials upon which is to be transferred, by means of pressure, rubbing, and burnishing, portions of colour not required in the finished work of art, as and for the purposes herein-before described.

Thirdly. I also claim obtaining an entirely novel effect in the process of tinting or colouring of my invention by the employment of bread in the manner and for the purpose described.

M. CARRIER'S SENSITIVE PAPER.

The Commission nominated by the Photographie Society of Marseilles, and consisting of MM. Gobert, Jeanrenaud, Paul Gaillard, and Civiale, have just made their report upon the keeping qualities, &c., of a new sensitive paper prepared by M. Carrier. The mode of preparing it is not stated, but it is believed to be a modification of the collodio-chloride process. The report is signed by M. Gobert on behalf of his *confrères*, and is as follows:—

"At a meeting of the Society held on the 7th February last, M. Carrier submitted to the inspection of the members an unalterable sensitive paper, suitable for the production of positive prints, of which he presented to the Society several specimens. We have now to report the result of experiments we have made with this paper.

"The prepared paper has been preserved in a sealed packet, in the chest of the Society, from the 11th February until the 27th April (75 days), care being taken to keep

it protected from the light. On opening the packet the paper was found perfectly intact, white, and presenting not the least sign of alteration, as may be seen from the two specimens annexed to this report.

"M. Carrier went through the process of printing in our presence, in the studio of M. Davanne, the negatives selected being of different descriptions, so as to offer a variety of subjects of different intensity. The printing was most successful. Without entering into any details with regard to toning and fixing, we may say that the manipulations with this paper required about the same time as with ordinary albuminized paper. It is necessary, however, to mention that M. Carrier employs a toning bath specially prepared for the purpose, and composed of—

Water...	1,000 centim. cubes
Sulphocyanide of ammonium	100 grammes
Chloride of gold and potassium	1 gramme

The toning is effected very promptly, the paper assuming an agreeable tint and rich tone. The prints are subsequently washed with some rapidity, and then plunged into a solution of hyposulphite of soda at a temperature of 20 degrees Cent., to complete the fixing of the prints, which has partially taken place in the toning bath. Finally, the prints are well washed in water as in the usual manner.

"We have the honour to submit to your inspection the pictures obtained in our experiments, and we hope that the Society will be of the same opinion as ourselves, that the advantages claimed by M. Carrier for his paper have been fully established by our experiments."

THE COFFEE PROCESS.

BY M. A. DE CONSTANT.*

PROFESSOR TOWLER has recently published in one of the American journals an article upon the different dry plate processes, and in it he makes some mention of the coffee process, a method of which I have had some considerable experience. In making a statement of the comparative value of the different processes, that gentleman states that, although at first the coffee dry plates are found to give superior results to those prepared by other methods, still, after the first day of their preparation, their sensitiveness becomes impaired, and the longer they are kept the greater is the exposure required; according to Professor Towler they lose their sensitiveness altogether in a few days.

As this statement stands in direct contradiction to the representations made by the discoverer of the process and his many disciples, and is likewise quite the reverse of what I have written, after experiments which have certainly been more complete than those instituted by Professor Towler, it is impossible for me to allow that gentleman's article to go forth unchallenged. I still stand by every word that I have said in regard to the great keeping qualities possessed by the coffee plates; at the same time I admit that the secret of their preservation is in a great measure due to the care with which the plates are dried. Rapid dessication by artificial heat and preservation in a dry locality are the conditions laid down by M. Baratti. This mode of proceeding is to employ a metal case with a false bottom in which water is placed and brought up to the boiling point by means of a spirit flame, and the plates are laid upon this water bath until they become so hot that it is impossible to touch them. Plates prepared in this manner will, after twelve months, or even two years, yield excellent negatives, and need not be exposed longer than four times the period that would be required if the plates had been freshly prepared. I have used coffee plates six months old which were over-exposed after a period of four minutes; during the first month of their preparation, when using a good apparatus, I never exceed an exposure of two minutes.

If Professor Towler had carefully studied the instructions given by M. Baratti for the preparation and preservation of

coffee plates he would not have come to the conclusion that their valuable properties are due merely to the moisture they contain, for it is precisely the damp that causes them the greatest injury. The plates owe their superior qualities to the special properties of the coffee, and in no way to their hygroscopic condition, as Professor Towler believes. This, in fact, explains the ill-success attending that gentleman's experiments, for coffee plates which have been imperfectly dried, or preserved in a damp locality, would, under no conditions, be equal to plates prepared and stored in a proper manner. I lay particular stress on the proper storage of the plates, as, in like manner with other dry plates, they become covered with a light deposit of moisture whenever they are exposed to a damp atmosphere or any change of temperature: if this moisture is not dissipated before the plate is put into the dark frame, it is almost certain that the film will be found to have become insensitive and useless. In winter there is a difference of three or four degrees between the locality in which I preserve my dry plates and the inside of my camera, and the manner in which the deposit of moisture takes place upon the plate is perfectly visible; it is only by the application of warmth that the plate again assumes its glossy appearance, and recovers its precious qualities.

It has been my intention for some time past to call the attention of photographers to this point, for it is a matter of some difficulty to maintain the dark-room, the plate-box, and the camera at an equal temperature. M. Baratti preserves his coffee plates in a box with fused chloride of calcium, but the great liability of this substance to become changed by moisture is a great drawback to its use.

If the bromide of silver collodion process of M. Carey Lea fulfils all that it promises, many of our present manipulations will be simplified, and failures from the effects of moisture will be avoided; for the dry plates of Mr. Lea, prepared without any preservative film, are so hard that it is almost impossible to moisten them, and a damp atmosphere would therefore probably have no effect upon them. During the last month I have been experimenting with this process, and the results obtained lead me to hope for excellent things from it. By the aid of certain preparations which I have been using, I have been enabled to work faster with plates two days old than with moist plates, and the pictures thus produced left nothing to be desired, either as regards beauty, softness, or detail. At the same time the uniform preparation of the bromide of silver collodion appears to be not unattended by difficulty. Mr. Lea at first advised that it should be allowed to stand for the period of a week, but now he prefers to leave it for a month.

ON THE REPRODUCTION OF ENGRAVINGS AND LINE DRAWINGS.*

BY F. FINK.

THE publication of the following remarks on the copying of engravings by means of photography has been decided upon by myself, less in the hope of making known new data in connection with such a proceeding, as for the purpose of pointing out certain reliable facts which may be serviceable to photographers engaged upon this description of work. Those who have experimented at all in this direction know that a collodion which gives excellent results in portraiture will yield but a poor, weak negative when used for the reproduction of an engraving or a line drawing. The reason of this is very simple: the iodizing of the collodion has been insufficient to produce the necessary vigour required in a picture made up solely of fine lines. To produce a good negative of this description it is necessary that a somewhat strongly iodized material be used, as, for instance, a collodion containing one-third more of the iodizer than would be required for portraiture work; such a col-

* Photographisches Archiv.

* Read before the Photographic Society of Vienna.

lodon that is condemned by the portrait photographer because it is over iodized and gives hard pictures is most suited to the purpose.

A negative of an engraving taken with collodion of this description, if sensitized in a slightly acid bath and exposed for a suitable period, should exhibit perfectly clear, transparent lines on an opaque, inky black ground. The exposure should be, if anything, rather too short than too long, for a full exposure, so necessary to the production of an artistic portrait, is fatal to the existence of fine lines in a negative of this kind. Over intensification of the negative must likewise be avoided, as the more delicate lines are easily destroyed by carrying this part of the process too far.

The intensifying solution I would recommend is a developer prepared according to either of the following formulæ:—

No. 1.—	Water	...	...	...	20 ounces
	Sulphate of iron	...	...	...	1 ounce
	Nitrate of potash	...	...	...	$\frac{1}{2}$ "
	Alcohol	...	...	...	2 ounces
	Sulphuric acid	...	...	...	$\frac{1}{4}$ ounce.
No. 2.—	Water	...	...	...	10 lbs.
	Citric acid	...	...	...	$3\frac{1}{4}$ ounces
	Sulphate of iron	...	...	...	2 "
	Alcohol	...	...	...	6 "

After the picture has been completely developed, the image is intensified by adding a few drops of a 20 per cent. solution of nitrate of silver, the treatment being carried on as long as the fine lines remain visible. After fixing, the plate should be well washed, and then again intensified with a concentrated solution of bichloride of mercury, the treatment with the latter material being repeated as often as may be thought necessary—say from one to four times. With No. 2 solution the subsequent intensifying with bichloride of mercury may sometimes be dispensed with.

The picture to be copied should, if possible, be lighted from the front, direct sun rays falling at an angle of from 50 to 80 degrees, yielding the best illumination; if the sun is higher and the rays fall at an angle of 10 to 30 degrees, shadows are cast by the texture of the paper, and the negative produced presents a rough, mealy appearance, which will be found to be in the highest degree objectionable when an enlargement of the original is prepared.

DETECTION OF HYPOSULPHITE.

BY M. CAREY LEA.*

THE subject of the examination of liquids for traces of hyposulphite of soda has assumed so much interest of late years, that, although the subject has been already well handled, a few more remarks may not be unacceptable.

Having recently had occasion to make some delicate testing in this direction, I tried all the methods usually recommended, submitting each to a rigorous examination upon solutions of hyposulphite made expressly, and of a known strength, and came to the following conclusions:—

Nitrate of Silver has been unduly condemned, for want of using it in the right way. I find it a very useful test when it is boiled with the suspected solution. The liquid to be tested is placed in a test-tube, a small crystal of nitrate of silver is dropped into it, and the solution is boiled. If any hyposulphite be present, the liquid presently turns brown.

It is to be observed that certain organic substances have the same tendency to turn brown a solution of nitrate of silver when boiled with it. To discriminate, drop in a single drop of nitric acid, and boil again. The liquid presently clears up and becomes colourless. Not that the sulphate of silver has dissolved, but has separated. It will be found at the bottom of the test-tube in the form of

minute black shining scales. By this test I have been able to detect the presence of one hundred-thousandth of hyposulphite; beyond this the indications cannot be relied on. This test, though delicate, is therefore surpassed by the following (it should be remarked, that when the hyposulphite is present in so small a proportion as one hundred-thousandth, the black scales just mentioned are not visible).

Iodide of Starch.—This reaction is more delicate than the preceding. The best course is that recommended by Dr. Vogel: to use two tubes, and place a piece of white paper behind them, the better to judge of the colour. The following is the method which I employ for preparing and using the iodide of starch:—Place about a quarter of an ounce of water in a test-tube, take up a bit of fine starch, grind it between the finger and thumb, letting the powder fall into the water (half a grain is sufficient); boil till the liquid is clear, and let fall in a single drop of tincture of iodine, agitate well, and let cool. Of this dark blue solution, allow a drop or two to fall into each of two test-tubes, an exactly equal quantity in each, then fill the test-tubes half full, one with distilled water, the other with the liquid to be tested. The colour of the blue should be just perceptible in the tube with common water; if, then, the blue disappears in the other, it is an indication of the presence of hyposulphite. This test is more delicate than the preceding. I obtain indications with one-millionth of hyposulphite, in this result agreeing with Dr. Vogel.

It is to be observed that the great difficulty in removing hyposulphite lies in the fact that photographic paper is sized, and, consequently, very difficult of penetration by fluids. I called attention, some years ago, to the fact that as most photographic paper contains a starch sizing, this affords a ready basis for testing. It is only necessary to draw a brush containing a very weak solution of iodine over a white portion of the paper. If the print is clear of hyposulphite, a blue mark will be produced; if traces of hypo are present, no dark result will follow. It is to be remembered that in using this method it is necessary to have ascertained beforehand, once for all, that the photographic paper in use contains starch, which, of course, is done by applying a little weak iodine solution to the paper before sensitizing. This should be done on the back, not the albuminized side. A blue mark indicates starch, and such paper is then known to be suitable for the application of this test. So far as I remember, this suggestion of mine was the first application of iodide of starch for detecting hyposulphite in photography, though such application was too obvious to be overlooked. Of course, the solution of iodine must be very weak, otherwise one portion of the iodine may destroy the trace of hyposulphite, and the remainder may bring out the blue reaction. This should never be forgotten in employing this test in all its shapes.

This mode of testing is decidedly surpassed by the following:—

Zinc and Sulphuric Acid.—It has been ingeniously proposed to convert the sulphur in the hyposulphite into sulphuric acid, and detect the latter by lead.

Much as has been said of this test, it has scarcely been done justice to. It has every advantage: ease, certainty, and wonderful delicacy. It has the great advantage that, if pure materials be used, there is no possible ambiguity in the result. Other substances, in the first method spoken of, may be browned by silver nitrate; and in the second, other reducing agents may decolorize iodide of starch. But, in the method here under consideration, nothing but a sulphur compound can produce the characteristic reaction with lead.

The liquid to be tested is to be placed in a narrow, deep beaker; a fragment broken off from a stick of pure distilled zinc, which, with a few drops of pure sulphuric acid, is to be dropped into the beaker. It is immediately covered with a piece of Swedish filtering-paper, twisted under the lip of the beaker. The wet stopper of an acetate of lead

* Philadelphia Photographer.

solution bottle is then to be touched in several places upon the paper cover. This last, being twisted under the lip of the beaker as just directed, confines the gases generated, to some extent, and gives them opportunity to act upon the solution with which the paper is imbued. The whole is then set in a warm place. If much hyposulphite be present the lead solution turns black; with less the effect diminishes. With such quantities a brown stain is produced.

By operating in the above manner, I have been able to obtain distinct indications from one two-millionth of hyposulphite, a faint but distinct stain appearing. I enclose the paper for inspection; on the underside a light brown colouration will be observed.

That this stain came from the infinitesimal quantity of hypo just spoken of does not admit of doubt, for in another beaker inside it were placed the same materials, but with water only—the same water that had been used for the hypo solution. The two, therefore, differed only in the presence of the one two-millionth of hypo: in the one the stain appeared, whilst the other remained white.

Whilst this is the best of all tests for hyposulphite of soda in solution, it must be remembered that any saline substance is but gradually removed from the interior of sized paper, so that, consequently, testing wash-water may lead to serious mistakes, unless the prints have remained in it sufficiently long for it to adequately represent their condition—some hours, I should say. I therefore think that, for practical purposes, in ordinary photographic operations, I should prefer the use of solution of iodine applied with a brush in the manner I indicated in 1864. The precautions which I then mentioned were, not to use the iodine solution too strong, but to prepare it by adding a few drops of tincture of iodine to several ounces of water; to assure one's self that the paper be one sized, in whole or in part, with starch; by observing that the iodine solution will strike a blue colour with it before it has sensitized; and finally, if the iodine solution gave the blue colour on the printing, to consider it as a proof that, with a little more washing, the print would be safe.

But, if the highest accuracy is desired, crush up one of the prints into a beaker with water enough to cover it, place a capsule or watch-glass over, and set it aside till next day. Then, touching the paper only with a spatula or glass-rod, squeeze out the water, and subject it to trial with zinc and sulphuric acid.

I am in the habit of using paper exclusively for drying glass-plates after cleaning them; and I believe it to be a needful precaution to ascertain that no trace of either hyposulphite or of chlorine is present. I find the best plan to be, to take out a trial sheet or two and test them. I test for hyposulphite with the zinc used; and the absence of chlorine and of hypochlorites is ascertained by observing whether a strip of litmus paper left in the beaker with the paper previos to applying the zinc test is bleached or not. In this way litmus paper is very useful, affording a treble indication, being turned red by acids, blue by alkalis, and bleached by chlorine and hypochlorites. (A strip of litmus paper should always be blue at one end and red at the other, to afford the double indication.) Ordinary cheap blotting-paper is apt to be faintly alkaline, perhaps from the presence of lime added with the hypochlorite of lime used for bleaching, which is always largely mixed with it, and of which some may be left behind when the hypochlorite is removed. Even if the lime has become carbonated by exposure to the atmosphere, this would not prevent its acting upon test-paper, as carbonate of lime has a slightly alkaline reaction upon test carbonates. Lime, of course, could not act very seriously; indeed, it is largely employed in the shape of whiting for cleaning plates. The object of using paper instead of a cloth is that it gives a brighter surface and is less apt to leave a pluff behind it. If a glass, just before collodionizing, be breathed upon and then be rubbed dry with clean bibulous

paper, it has a better chance than if brushed over with camel's-hair brush, for the latter, in certain states of the atmosphere, may leave marks behind it; but paper to be used for photographic glass must not be left about exposed to fumes of a laboratory.

I inclose a piece of Swedish paper, with a brownish stain obtained from a two-millionth solution of hyposulphite.

Recent Patents.

PORTABLE PHOTOGRAPHIC LABORATORY.

BY HIPPOLYTE ROCHAT.

The following plan for a portable laboratory was only provisionally specified:—

This apparatus is composed of a rectangular wooden case hermetically joined, the dimensions of which are regulated by those of the basins and frame intended for the operations. The normal or ordinary plate requires interiorly from about 20 to 22 inches in length by about 14 inches in breadth, and an equal height. The top or lid opens from the front backwards to a width of about 10 inches, and from the back forwards in a breadth of a little over 2 inches. The middle part remains fixed. These two openings are provided with yellow glasses lighting the interior. A moveable covering intended to prevent the reflection of the light on the surface of the glasses when it is raised, and to preserve these from contact with exterior objects when it is lowered, is joined by means of hinges to the fixed part of the lid; the sides or overlaps of this shade slide on the exterior of the sides of the case, covering the openings of these sides, and are fixed by the operator at the desired height by means of an adjusting screw. The two sides and the front of the apparatus are pierced about $1\frac{1}{2}$ to $1\frac{3}{4}$ inches above their centres with a round opening of from 5 to 6 inches in diameter, to which is fitted a sleeve of a thick black fabric about 8 inches long, and terminating in an elastic wristband. A groove intended to receive the frame, hollow or projecting, according to the construction of this latter, is placed at the bottom of the case at the end, and at the height of the basins; it serves to give to this frame the necessary slope or inclination for preventing the fall of the glass plates into the interior of the apparatus. A small spiral spring presses against the frame when the opening by which it has been introduced is closed, it keeps it in its position, and adds to the facility of seizing the glass plate, as both hands may be employed. Lastly, four sliding feet placed at the angles permit the raising of the laboratory and placing it horizontally on any ground. The dimensions of this apparatus, according to the sizes to be obtained, may be determined in the following manner:—

Length.—The breadth of the two basins suffices, as the blotting-paper may be placed even more commodiously on the side of the covering of the basins which presents itself when the basin with the silver bath is uncovered.

Breadth.—The length of the basins, plus the distance from the groove intended to receive the frame to the back of the case, calculated according to the inclination which it is desired to give to this frame.

Height.—That of the frame starting from this groove.

Method of Operating.—The photographer changes nothing in his ordinary manipulations. Arrived on the spot for his operations, the case is set horizontally, two basins of equal dimensions are placed in the interior one beside the other, the sensitizing bath is poured into the one and the developing bath into the other, at the choice of the operator. A small flap fixed to this latter by hinges permits their being alternately covered to prevent splashes from one bath into the other. The glass plate, collodionized in the full light, is placed in the frame; this latter is introduced into the dark chamber by the back opening, which is reclosed; the hands, passed into the sleeves, take the glass plate in this frame (which must not open from the bottom upward); it is immersed in the silver bath, drained on the blotting-paper, replaced in the frame, brought back in the apparatus after the pose, and the development made in the second basin. It is afterwards withdrawn by the large opening in front, washed, fixed, and even strengthened, if necessary, in the usual manner. It is very useful, in order to prevent the chafing of the edges of photographs enclosed damp or unvarnished in the special boxes, that the grooves of these latter

should not be square and about the thickness of the glass plate; but triangular, so that the edges of the plate have no point of contact with them but by their extreme angles. The operations ended, the object glass, the dark chamber, the basins, flasks, and so on, are placed in the apparatus, which thus serves as a packing case, and is no encumbrance.

EXPERIMENTS WITH FILTERING PAPERS.

The *American Journal of Pharmacy* contains an interesting account of a series of experiments by Mr. C. E. Avery, undertaken to test the relative value of various forms of paper-filters. Some condensed extracts from the article may be useful to many of our readers.

"The filter most commonly employed in analytical laboratories is a circular piece of paper folded twice upon itself into the form of a quadrant, and supported on a glass funnel with straight sides. This filter, though commendable in so far as it is capable of supporting the weight of a considerable column of liquid without breaking, is objectionable, inasmuch as liquids cannot pass through it so rapidly as is desirable. Since at almost every point the paper is in close contact with the glass, but little of the liquid can flow off between the filter and the sides of the funnel.

"Several schemes have at various times been proposed for opening water-ways between the glass and the paper; the interposition of straws, glass rods, and splinters of wood between filter and funnel, as well as fluted funnels and plated filters, are all devices looking to this end.

"The advantages of the plated filter are so great that some chemists prefer to use it, even in quantitative analysis, instead of the common form, in spite of its greater liability to break, and the difficulty of washing the precipitate.

"Another excellent method of increasing the speed of filtration, suggested by the German chemist, Fleitmann, consists in placing one plain filter within another of coarser fibre; for instance, a fine, plain filter of Swedish paper may be placed within another plain filter of coarse German paper, supported, as usual, on a funnel.

"In experimenting upon these various forms of filters, it occurred to me to fold the plain qualitative filter in two operations instead of one. In place of folding the filter doubled upon itself down the middle in the usual way, I proposed to turn down on each side of the paper a fold equal to one-quarter of the semi-circle, and then to fold the sectors of 45° arc thus formed back upon themselves.

"The filter is then opened without disturbing the folded portions, and placed upon the funnel. In this form the triple side of the plain filter is broken up, and the folded portions keep open passages, instead of hindering filtration.

This filter, as tried against the plain form, gave, 1st, 133 : 100; 2nd, 111 + : 100; 3rd, 205 + : 100.

"Two plain filters ran equally in several trials; each was changed into the other's funnel, and No. 1 ran 33 per cent. less than No. 2. No. 1 was dried and folded into my form; remaining in the same funnel, it ran 32 per cent. faster than the other. Both filters were then opened, and showed no tear or weakness when held against the light.

"As these filters gave different results in different funnels, I thought I would ascertain the cause. The water seemed to be retarded in its passage by the attraction of the glass; therefore, those funnels having the greater portion of the paper free from the glass would be the best; that is, a broad-throated funnel, other things being equal, will filter faster than a narrow-throated funnel.

"To test this point I selected two large funnels: No. 1 had three times as broad a throat as No. 2. With the first filters they ran:—

117 : 100 123 : 100 133 : 100 118 : 100

"The reason for this low difference was found in a thin spot near the point of No. 2.

"I understood the idea of the Fleitmann filter to be this: that, likening a plain filter to a peat bed resting upon an impermeable sub-soil, it might be compared to a porous

substratum interpolated between the swamp and the clay bottom.

"To test this idea a Fleitmann filter was made and wetted, carefully patting down and smoothing out any irregularities. It was tried against a plain filter which was placed in a funnel with but two-thirds as wide a throat as that of the Fleitmann. It ran 114 : 100; that is, the passages kept open by the elasticity of the paper, the creases and abutting edges liken this filter to tile drainage.

"To increase the size and number of passages I tried putting the inner filter into a plated filter of coarse paper. Changing the filters after each trial, I found this form gave the following results as compared with the plain filter, calling the latter one hundred:—

1st trial	184 : 100	4th trial	166 : 100
2nd "	201 : 100	5th "	170 : 100
3rd "	250 : 100		

"I afterwards found a thin spot in the plain filter of the fourth trial.

"I thought, since the adhesion of the water to the glass is the cause of slow filtration, I might increase the flow by coating the funnels on the inside with paraffin, to which water does not adhere. No. 1 being coated, No. 2 left clean, I got—

1st trial	200 : 100	3rd trial	100 : 100
2nd "	184 : 100	4th "	137 : 100

"The filters in the third and fourth trials were the same, but the funnels were changed about."

Correspondence.

CARBONATE OF LIME IN TONING.

SIR,—Mr. Bovey, in the last of his interesting papers upon Printing and Toning, has kindly promised to answer the questions of his readers.

As far as I can see, his objection to the use of carbonate or acetate of soda in the toning bath would not apply to the pure carbonate of lime, which, while it would neutralize any excess of hydrochloric or nitric acid which might be present in the chloride of gold, being itself insoluble in water except with the assistance of carbonic acid, would probably be unable to act upon the neutral chloride of gold.

I have been in the habit of using precipitated chalk and chloride of lime in preparing a toning bath, and have been very successful with it, and have seen first-rate tones produced by it in the hands of my friends. Probably Mr. Bovey would object to the use of chloride of lime, on account of the free chlorine; but as the prints are immersed in the toning bath without any preliminary washing, it is neutralized at once by the free nitrate of silver in them.

If Mr. Bovey will give his opinion upon these points, I shall be much obliged.—Your obedient servant, AMATEUR.
Brighton, June 30, 1868.

Talk in the Studio.

ROYAL PHOTOGRAPHERS.—The *Censor* is somewhat hard upon photographers, or else upon their royal sitters. In a column of things "Wanted," and "Not Wanted," it has the following:—"Not Wanted"—any more of those dull, ordinary, common-looking photographs of the royal family. N.B.—Photographers have done more to destroy the ideal of royalty than all the republicans in the world; the Briton, as he passes a shop, or stumbles over H. M. Q. V. in an album, involuntarily quoting Pater Pindar—What's that, the Queen? what, that thing there?"

MEMORIAL CARD MOUNTS.—Mr. S. B. Beal has submitted to our notice a very neat form of card mount intended for the portraits of deceased friends. A good design in black is printed on a delicate grey or lavender tint. Interwoven in the design are various scrolls to be filled in with any inscriptions chosen, the centre being an oval for reception of the portrait.

INTENSE NEGATIVES.—A correspondent of *Humphrey's Journal* says:—"No doubt some of your readers, as well as myself, are sometimes annoyed with negatives getting too intense after a number of prints have been made from them. Several remedies have been suggested. Some recommended floating the paper (after sensitizing) on pure water, in order to have less free nitrate on the surface; but I think it is always best to have the negative of the proper printing qualities. My mode is as follows: Take equal parts of liquid ammonia and alcohol; then wet the varnished surface of the negative with water; then flow the solution over one plate, and allow it to remain on only long enough to soften the varnish, not to remove it; rinse well with water. If the negative has been strengthened with mercury, flow first with cyanide solution; should you still wish more reduction, rinse well, and flow with bichloride of mercury, and then again with the cyanide solution. This can be repeated as often as necessary, and the strongest negative can be so modified as to give beautiful prints. The above operation will only reduce the intense parts of the negative, leaving all the half tones undisturbed; and it does not take as long as it does to write the above. If there are any who doubt it, let them make a trial with some old discarded negative that has become too intense; and if they like it as well as I do, they will adopt it until some brother photographer introduces something better."

THE SPECTRUM RECONSTRUCTED.—Prof. Listing, of Göttingen, considers the solar spectrum as made up of nine colours, in the following order: brown, red, orange, yellow, green, blue, indigo, violet, and lavender. He has also calculated the number of vibrations of each, and has found that their numbers constitute an arithmetical progression; the interval between one colour and the next always being 48,524 billions of vibrations per second. The number of vibrations constituting the two extreme colours are represented by 364 trillions for the brown, and 801 trillions for the lavender.—*Scientific American*.

TO MAKE PLASTER OF PARIS HARDER.—With one exception, all admixtures impair the hardness of the plaster. The exception is iron filings. When these are mixed with plaster they rapidly oxidize, and the coherent mass of oxide of iron formed adds its own strength to that of the plaster, making a very firm mass, which has also the advantage of strongly uniting itself to surfaces of iron. I have not observed what proportion of the filings is best, but suppose they should form about one-fifth the whole weight.—*Ibid*.

To Correspondents.

M. D. L.—It is probable that your collodion will be improved by the addition of more pyroxyline. We find the sample you have forwarded gives a thin limpid collodion with 6 grains to the ounce of solvents; if, therefore, you have used only 4 grains the collodion will be too thin. You may also, without impropriety, add 1 grain more per ounce of iodide and $\frac{1}{2}$ grain of bromide. The formula you quote is doubtless a very old one. The newness of the collodion has also, you must remember, tendency generally to cause it to yield thin images. 2. The addition of a little gelatine or sugar to the developer will doubtless aid you in securing more intensity.

J. F. B.—In attempting an operation like making your own chloride of gold you should, unless tolerably well versed in chemistry, take some carefully stated formula and follow it accurately. After dissolving your gold in aqua regia you should, if you wished to employ the chloride of gold formed with certain specific formulae, have got rid of the acids by evaporation. Neutralizing the acids by adding chalk does not remove them. You form nitrate of lime, chloride of calcium, and when phosphate of soda is added to the solution phosphate of lime will be formed, which, being insoluble, is precipitated as you describe. Gold is not soluble in sulphuric acid, but after forming the precipitate from such a solution as you describe nitric acid would be present, and gold in a fine state of subdivision is, in some degree, soluble in a mixture of sulphuric and nitric acids. 2. Dilute sulphuric acid will dissolve the zinc and leave the silver intact.

C. E. F.—We find that toning solutions prepared by different formulae give distinctly different results; some tending to black tones, others to warm tones; some bleaching a little and increasing brilliancy, and others toning without altering the character and depth of the print. We cannot very well tell you which we recommend, therefore, without knowing the kind of result you require. We sometimes use the acetate, sometimes the lime formula; but that we most commonly employ—because it is simple, effective, and readily prepared—consists in the addition of a few grains of chalk to the standard solution of chloride of gold (1 grain of the salt in

1 drachm of alcohol), and pouring sufficient hot water upon it to make the desired strength, generally 5 or 6 ounces to the grain. By the time this solution is cold it is fit for use, and gives good results. 2. The object of adding spirits of wine to the paper sensitizing bath is to reduce its tendency to dissolve the albumen and get discoloured. This it does very efficiently. The chief object of adding sugar to the bath is to enable the paper to be kept longer without issuing in discoloured prints. Very little will serve; about a drachm of sugar to a quart of solution. Read Mr. Bovey's article in our last YEAR-BOOK, and his article on toning in last two numbers of the NEWS. Also see our YEAR-BOOK for various toning formulae.

JAMES STODDARD.—The conditions of success in producing good copies of a pen-and-ink drawing are somewhat different to those required in portraiture. In the latter you want softness and gradation, with no approach to pure white or deep black except in minute points; in the copy of the pen-and-ink drawing, like that enclosed, you require a large space of pure white, and such blacks as there are very intense. Presuming that the drawing is on pure white paper, you need have no difficulty. Use an old ripe collodion of good body, and develop with a gelatine-iron developer, and take care not to dash the developer over the plate, so as to drive all the free silver off the film. If, after fixation, the white portions are not quite opaque, wash the film well, and intensify with pyro and silver, first treating the film with a dilute solution of iodine, washing it again, of course, before applying the intensifying solution; or you may, if you are familiar with the results, employ any of the mercury intensifying processes, or the solution of Schlippe's salt, or of permanganate of potash. Any of these will increase the intensity of the finished print. Try again, and let us know the result.

W. J. A. G.—We are not familiar with the exact form of stereo camera of which you send us cardboard model; but the working of it seems tolerably clear to us. The operations will be very similar to those of the Latimer Clark camera, which we described last week. If you focus with the pointer placed opposite *a*, and then move the bar with the pointer opposite the 2 at either side, the image should still occupy the same place on the ground glass and be quite sharp, in one case a little more of the right side of the subject being taken, and in the other a little more of the left. To work the camera after focussing with the pointer at *a*, and seeing that the images come right when it is moved to either side, move the point to the right-hand 2, and proceed as we last week described. By moving the camera nearer to or further from the pointer end of the bar, you increase or decrease the distance between the points at which each picture is taken. 2. The design on the back of your card is very good, and the hint to exacting friends neatly conveyed. 3. The tone and general quality of the print are good; but the negative is just a little under-exposed.

J. STUART.—It seems probable, from a general examination, that the spots are due to imperfect fixing and washing, the result having been finally brought about by the damp; but we will examine the matter more carefully, testing both prints and cards, and then report.

GARNIER.—Thanks for the interesting photographs of Victor Hugo. Messrs. Marion and Co., Soho Square, or the London Stereoscopic Company, Cheapside, may probably find customers for such pictures.

ONLY AN AMATEUR.—The instructions given in the printed paper were not definite. The portion of bichromate supplied was to be dissolved in *some* water. If you wish to try such a mode of printing you may dissolve an ounce in a pint of water. Various formulae for bichromate printing processes have appeared in our pages. 2. A good intensifying solution of pyrogallie acid may be made as follows: 3 grains pyrogallie acid, 2 grains citric acid, 1 ounce water, with a few drops of a fresh 20-grain solution of nitrate of silver added just before use. After developing with your iron solution, wash thoroughly and intensify with the above; or you may intensify after fixing with the above, if you wish.

MAGNESIUM.—The time required for fixing depends somewhat upon the quality of the paper used. Thick paper requires a longer time than thin paper. If your enlargements are produced upon drawing paper thirty minutes will not be too long; for a stout photographic paper about twenty minutes will suffice. Wash the print very thoroughly after development before immersion in the fixing bath. The object of the acetic acid in the nitrate bath for the printing by development process is to restrain reduction and prevent discolouration of the whites.

E. GREGSON.—The person whom you mention has made a composition with his creditors, and is, we believe, retiring from photographic business. Possibly your letter has been accidentally overlooked.

ERRATA.—In Mr. Waterhouse's article on Photo-zincography, p. 294, para. 3, line 4, for "cemented" read "connected." In corresponding line of next column, for "glycerine" read "glycocine." In last week's issue, p. 310, in the heading of Mr. Gaffield's letter on the Transmission of Actinism, for "light" read "glass."

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 514.—July 10, 1868.

CONTENTS.

	PAGE
Portraits with Landscape Backgrounds: Double Negatives.....	325
Take Price on Portraiture	326
Critical Notices	327
Pictorial Effect in Photography. By H. P. Robinson.....	327
On the Principles of Lighting and of Constructing Studios. By Dr. H. Vogel	329
Toning and Fixing in One Bath	331
Collodion without Bromides	331
On a New and Simple Method of Recovering Metallic Gold and Silver from Residues. By Victor G. Bloede, Chemist.....	331

	PAGE
Piracy and Informers	332
Mixture for Retouching Negatives. By William Bell	333
More Piracy of Engravings.....	333
Separating Gold from Silver	334
Correspondence—Carriage of Photographic Goods Abroad—Panoramic Camera.....	334
Talk in the Studio	336
To Correspondents.....	335
Registration of Photographs	336

PORTRAITS WITH LANDSCAPE BACKGROUNDS —DOUBLE NEGATIVES.

SINCE we called attention some months ago to the charming card pictures of Mr. Edge, in which a landscape taken from nature is introduced as a background to the portrait, many ingenious suggestions for modes of double printing* and for the production of double negatives have been communicated to our pages. We have now to introduce to our readers a mode of producing a double negative by which the figure and landscape background can be printed successfully at one operation. The method we are about to describe is due to Mr. Burgess, of Norwich, and is, we venture to think, so simple and efficient as to leave nothing further to desire in this direction. By the use of ordinary skill, care, and taste, double negatives with various effects can be produced, and the printing is conducted in the ordinary manner without extra care or trouble. The examples which Mr. Burgess brought under our attention some weeks ago, when he favoured us with a visit, were described as merely experimental essays, but their excellence afforded sufficient warranty of the capability of the process, and we apprehend that the beauty of the results, so far as the background can influence it, need only be limited by the art skill of the photographer.

The plan devised by Mr. Burgess consists in a new use of our collodio-chloride process. A negative is taken, as usual, in the studio, with such foreground effects as may be suited to the finished result; the background screen must, however, be a dark one, either black or as nearly so as the darkest part of the landscape. When the negative is completed it requires a protective coating, which prevents the film from being dissolved or injured by the next coating, which consists of collodio-chloride. Mr. Burgess at first used india-rubber-solution, but has since found that albumen answered better, and the latter will doubtless aid in securing vigour in the image. When the protective varnish of india-rubber or albumen is dry, it receives a coat of collodio-chloride of silver, and when this is dry the figure and foreground are carefully painted out upon it with indian ink applied with a camel's-hair pencil. This done, the sensitive collodio-chloride film is exposed under a transparent positive obtained from any suitable landscape or other negative which may be chosen, and a negative image so produced. It is then fixed and washed in the usual manner. Toning, it will be observed, is unnecessary, as the brown tint of hypo fixing is most suitable for printing purposes. The indian ink which masked the figure is washed off in the course of the fixing and washing, and

the figure and foreground remain as in the original negative.

We subjoin Mr. Burgess's communication, received since we saw him, in its integrity:—

"My dear sir,—I have pleasure in sending you my promised communication on 'double printing,' or rather *double negatives*, but my time has been too much occupied to permit me to experiment with it so far as I should have liked. However, the specimens I send herewith are sufficient to show that it can be done satisfactorily. When used with taste and skill, I think the method will give great power to the photographer, as it is possible to make the background harmonise and blend with the figure; and this being done on the negative, of course the printing proceeds with no more than the usual trouble. I quite appreciate *good printing*, but, I think, as a rule, we do not spend sufficient time and care in producing negatives of a superior quality.

"The admirable little pictures by Mr. Edge first induced me to give my attention to double printing more closely than I had hitherto done, although I had frequently printed in skies and made use of the *dodge* in other ways without any scruple as to its legitimacy. I did not until then fully realise the additional power which is thus gained by the photographer. At first I took the figure and foreground with a light background, graduated to dark grey at the bottom. A print having been taken from this, I painted out the figure and foreground with indian-ink (this is easily done by any one who can draw moderately well, even with a profile), and laid the print upon the background negative. When the print is washed, prior to toning, the indian ink is carefully removed, a little friction with a brush being sometimes necessary. The advantage in this plan lies in the fact of its being possible to follow very intricate outline without any fear of the mask slipping. Another plan is to paint a mask on 'vitrified' sheet india-rubber, or talc. This is laid over the print and gummed in its place. I have made the 'sheet india-rubber' by coating a glass alternately with collodion and india-rubber until of sufficient thickness.

"But it is the plan of making a double negative which I think is most useful, and I will proceed to describe my method of doing this. I take the negative of figure and foreground with quite a dark, plain background, and, whilst still wet, after fixing, flow over albumen and water mixed in equal parts. When dry, I coat the plate with collodio-chloride of silver, and when this is again dry paint out with indian-ink all the figure and foreground. I then proceed to print from a transparent positive of the background on the collodio-chloride of silver, which will, of course, produce a negative of the background at the back of the figure.

"I have also tried coating the negative of figure, &c., with india-rubber, and preparing as a dry plate, but found

* We may here remark that Mr. Robinson has recently reduced double printing to a system of great simplicity, arranging the negatives for combination in a picture so that they may be worked by his ordinary printers by a system of registration, in which care to follow instructions alone is necessary to success. We shall have something to say on this subject shortly.

it more unmanageable than the plan described above.—
I am sir, yours very truly, J. M. BURGESS.
"Norwich, July 3rd, 1868."

The method referred to in the last paragraph of Mr. Burgess's communication had also been proposed to us by Mr. Cherrill as a means of securing a double negative. The chief objection to it is the risk to the first negative involved in its re-immersion in the nitrate bath, and the prolonged operations involved. Probably the dry collodion tissue, as prepared by Mr. Woodbury on a basis of leather collodion, might be found useful in some cases, with the advantage of being detached from the negative at will; but none of these plans seem so simple and efficient as that proposed and carried out by Mr. Burgess.

There is another facility presented by this mode of securing double negatives which should not be overlooked. Whilst it is proposed as a means of introducing landscape backgrounds to figures, it is obvious that this is not the only purpose for which it is available: the production of groups from various negatives taken at different times, or the introduction of objects or accessories—in short, any combination difficult or impossible to be gained on one plate with one exposure—may, by the exercise of skill, be brought together in one negative, and printed at one operation.

LAKE PRICE ON PORTRAITURE.

THERE is no department of photography upon which Mr. Lake Price will be heard with more profit to the student than that which treats of portraiture and the rendering of figures generally; and, as we have before stated, his new work contains very much on this subject which will be read with eager interest by the professional portraitist. We propose here to lay before our readers, in extracts or epitome, some of his instructions in this department of the art.

Whilst dimension is stated to be an element of great importance in photographic portraiture, Mr. Price points out the great difficulties necessarily involved in attempting large direct exposure. A lady whose huge photographic portraits have been much praised in *delectante* art circles, claims it as a merit that they are taken direct, and admits that very long exposures are required—so long, in fact, that we heard it once facetiously remarked that it was quite admissible for the sitter, wearied with the long exposure, to stretch his legs by a turn round the studio during the exposure. Mr. Price, deprecating especially protracted sittings, says: "The sitter's countenance, which, had it been taken rapidly, would have been life-like, sparkling, and intelligent—no matter what his good looks or otherwise—becomes leaden, rapid, and, indeed, loses its resemblance to the original; for the soft and mobile parts of the face, round the mouth—which is the chief seat of expression—have so drooped that their very form is altered during the sitting." "Thus," he continues, "photographs which have been attempted, approaching *life size*, have been most abortive and disagreeable, and heads of three and four inches have not yet been obtained, with the *figure and hands* in the picture in fair focus and drawing, and when the *head alone* has been given, the operator has been obliged, in order to obtain any degree of rapidity, to use too large an aperture, and the *line* of correct focus traversing the face is, on both sides, in immediate contact with distorted forms. When it is desired to take heads *of this size* it is useless to attempt the hands and figures; the face must occupy the *central* portion of the lens, and, thus treated, heads of study, &c., can be obtained up to four inches or so. It is at these dimensions especially and those approximating to them, either larger or smaller, that the new portrait lens of Dallmeyer shows its superior capabilities, and becomes most valuable to the photographer; giving a general fleshy softness to the features in lieu of the metallic hard appearance, and by increasing the depth of perfect focus."

The largest size at which he considers a portrait can be

undertaken to include the person and hands, giving a three-quarter length, may have the head about 2 inches in length. Suitable lenses for such work may vary from 4½ inches to 6 inches in diameter, and from 15 to 24 inches in focal length. Groups in which the figures must be smaller may be on 20-inch plates; but for single figures he recommends 12 by 10. His remarks on card portraits we give at length. He says:—

The "carte-de-visite" is the smallest size it will be necessary to notice. The great popularity it for so long a period enjoyed shows that the qualities it possessed must have largely satisfied the taste of the public. The time of exposure, depth of focus, completion, delicacy, and rotundity of the image it possesses, are qualities which are only obtained with the greatest difficulty and under the most favourable circumstances in larger works. The damaging condition was this—that from the extreme facility of their execution they became extremely commonplace, and that when the photographer had the talent of arrangement necessary to compose a *picture*, the time so occupied would not be repaid by the small charge customary, whilst the public, entirely ignorant—as a mass—of art principles, was equally delighted to find itself depicted as abiding in Cockney Gothic interiors of a cathedral character! bought by the square foot of some dauber, with vulgar and absurd accessories—as it would have been with a higher grade of representation. Many very charming works may be selected from the mass—"vari nantes"—in the ocean of mediocrity, which show that "small sizes" are, as a rule, the thing to attempt photographically. The *carte-de-visite* may be divided into four distinct classes—the head only, of about one and a quarter inch in size; the half-length; three quarters; and full. The first, unless executed by a very first-rate operator, is apt to look distorted, coarse, and exaggerated, but has the advantage of giving details of the countenance—sometimes too much so, indeed—of interesting individuals. The instrument proper to take such pictures is a 3½ double lens, 10-inch focus; they are often taken with less diameter, but suffer in consequence, as the lens has to be approached too near the sitter and is "strained." The next size appears to the writer to offer the greatest advantages; the head is as large as in the so-called "cabinet" size, the hands can be included without distortion, and sufficient of the body to give interest—for six and eight inch focus lenses are the proper ones to employ, and of the best makers—considerable rapidity is gained over the ten inch focal length.

The full-length size is executed with lenses of two-inch to three and a quarter-inch short focus in diameter; according to the space at the command of the operator to withdraw his camera further and further from the sitter. It is in all cases better to do so, to the extent the lens will allow; to properly fill up the dimension, rather than attempt to take sizes above the power of the instrument by approaching too near the model. Generally speaking, an extreme definition, approaching the steel, has apparently been more valued and attempted than artistic qualities, and the hacknied positions and commonplace accessories have done much to wear out the subject. The dimension being so small, the utmost *fineness* and delicacy—not wiriness of execution—is necessary in these works. Development by iron should alone be practised, and the whole scale of light and shade, from bare glass in velvets, &c., to opaque white, in *small quantities*, be utilised in the subject, thereby giving relief, sparkling brilliancy, and effect.

The cabinet portrait Mr. Price admires, but considers that they will require more skill in the photographer. Possibly that is the reason for their tardy progress in popularity in this country. He says:—

The "cabinet" size portrait is the last form which appears as a candidate for public suffrage. It has many advantages; its increased dimension permits a "closer acquaintance with the original," without his being absolutely put to the microscopical examination of injudiciously treated larger sizes; the enlarged scale showing them better, renders it more worth while to pay additional attention to the accessories and chiaroscuro, but at the same time, as it shows their excellencies better—when they exist—it most certainly equally emphasises defects; and full-lengths, male sitters especially, cannot be rattled off with the indiscriminating facility of the "carte," if absurd want of aplomb or other damaging shortcomings are not to obtrude themselves on the beholder. In fact, the "cabinet" will be found much more difficult to bring to an *equally* satisfactory result.

Although himself a skilful artist, and not opposed to the occasional retouching or doctoring of either negative or print if required, Mr. Price does not believe that any skill in retouching can produce pictures equalling the best results of pure photography, and would never dream, when he met with prints of unusual excellence, that they must necessarily be retouched. He says:—

No "*skilfully retouched*" (?) picture could for one moment compete with the qualities displayed in the large vignette heads of T. R. Williams, or other successful photographs. Modifications of the

above manipulation are applicable to larger portions of the picture; namely, weakening by cyanide the too dense deposit on portions of background, accessories, &c., thereby "keeping them down," or by a general "tint," of greater or less opacity, lightening portions or masses, thus giving "breadth of effect." These latter treatments, equally applicable to landscapes, interiors, &c., &c., as they do not interfere with the *drawing or definition given by the lens*, are, if skillfully managed, unobjectionable; in many cases, even desirable, improving light and shade, massing too minute detail, giving "breadth of effect," and artistic qualities.

A pregnant hint on the study of art is conveyed in the following paragraph:—

In portraiture the student should refer to prints from the works of Velasquez, Titian, Vandyke, Rembrandt, Rubens, our own Gainsborough, and Sir Joshua Reynolds, eschewing the affectations of the periwig school of Mignard and Lely. If he really can do anything, this study will surely bear fruit and make itself felt in his works. It has lately been matter of observation how much the study of art principles has enabled M. Adam-Salomon to prove the fallacy of the idea that the photographic representation is a mere mechanism, dependent upon the lens and the box it is mounted in, whereas in this department of it, and in all that is arranged and composed from the human figure, the will, intention, and idiosyncrasy of the producer makes itself felt as completely as though he were at work with palette and brushes.

But whilst Mr. Price holds that there is no result which is given by perfectly successful untouched photography, he is not opposed to the employment of any aid which may compensate for the occasional shortcomings of photography. If we remember rightly, he was the earliest authority who recommended securing a control over the development of certain parts of the negative by using a glass syringe to displace a little developer in some small part of the negative where diminished intensity might be desired; or to add a drop of nitrate of silver on some portion of the image where augmented vigour would be useful. On retouching the negative, he says:—

In a variety of ways, however, the necessity will arise for touching upon the negative; the following are the most general causes: light grey or blue eyes. Besides *profile* treatment, which is the most judicious for such subjects, the pupil of the eye should be *most carefully* and skillfully touched with a small sable brush just dipped in a solution of cyanide. This must of course be done before the negative is varnished, and it must be *carefully* washed afterwards; no scraping can equal this treatment. The high light may now be added in black varnish or vermilion, zinc white, &c. Under-exposed negatives, or harsh lines on the sitter's countenance, may be worked over very extensively, using a *magnifying glass*, with either of the following: Take a piece of glass with a coarsely-ground surface, rub it on a "Paber's" black-lead pencil, add spirits of turpentine, thoroughly mix, better *grind* under a glass "muller," stipple, and soften the asperities. Another method: remove old films from glasses in water, as directed, page 91; recover them by percolation through linen; *when dry*, treat them as above in every particular. A successful portraitist at Vienna is said to be very clever at this "touching up;" but, however skillfully all this sort of thing may be done, the result shows the means employed, and, to those competent to judge, is, as before stated, merely an expedient which, whenever possible, should, by proper treatment, be rendered quite unnecessary.

We must for the present conclude our extracts, promising to recur to the subject again on an early occasion.

Critical Notices.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY FAMILIARLY EXPLAINED; Being a Manual for Beginners and Reference Book for Expert Photographers. By JABEZ HUGHES. Eighth Edition. (London: 379, Oxford Street.)

It is an opinion which has been entertained by many that the depression which has for some time prevailed in professional photography has been chiefly due to the large number of persons who have acquired and practised the art. If the dictum were accepted as true, we know of no one who would be so largely responsible for that depression as Mr. Jabez Hughes, who has, we believe, contributed by the Manual before us to make more photographers than any contemporary instructor. If, however, on the other hand, it be

held, as we contend it ought to be, that the cause of the depression has been more due to the number of bad photographers entering the profession and initiating a race for cheapness instead of a struggle for excellence, then Mr. Hughes must be entirely exculpated, for no one has more contributed to make good photographers than he.

Every edition of the manual, of which the eighth lies before us, contains some addition and improvement, the result of a most intimate practical acquaintance with every important branch of the art, and of a rarely conscientious desire to omit nothing which either student or advanced practitioner of the art ought to know. As the work is so well known, it would be superfluous to enter into a detailed description of the plan upon which it is written, combining rigid accuracy of instruction with a singularly pleasant familiarity, simplicity, and lucidity of style; but the point which will interest our readers most to know is, that all the regularly worked processes of photography as described here are given with the latest modifications which trustworthy authorities have accepted as improvements, and that the work may be safely accepted as a *vade mecum* by skilled photographers as well as studied as a primer by those who have only just approached the threshold of the art. Our space does not permit us to give any extracts at present, but we shall seek early occasion to quote some important matter from the pages of the new edition.

THE PHOTOGRAPHER'S REFERENCE TABLE, for Studio and Field Work. By L. G. BENSA. (London: Carter and Piper, Gough Square.)

THE object of this Reference Table is to enable the photographer to ascertain without troublesome calculation four specific things, the necessity for a knowledge of which is constantly arising: *first*, the distance between camera and object with a given size of subject to be taken and image required, and a lens of a certain focus; *second*, what the equivalent focus of the lens should be when size of subject and image and distance of the camera are already determined; *third*, what size the image on the focussing screen will be at a given distance from the subject of a certain size and with a certain lens; and *fourth*, the amount of angle included when the image is of a given size with a lens of given equivalent focus. The photographer is here presented with the means of obtaining this information by certain simple rules and reference to a table provided. An "Angle Tape" is provided, by which and a two-foot rule the photographer may ascertain the amount of angle included in any given view by a very simple process of measurement. The Photographer's Reference Table will doubtless find its way into the studios of all photographers, who will thankfully avail themselves of the facilities Mr. Bensa has placed before them for ascertaining accurately and easily facts which many of them have only guessed at or groped after.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURA FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XXIV.

"The satirical rogue."—*Shakespeare*.

SOME OLD NOTIONS TOUCHING PORTRAITURE.

HAVING concluded my task as far as relates to the composition of lines, and having touched upon photographic portraiture and all concerning it, before I commence what I have to say on chiaroscuro I feel tempted to interpolate a chapter culled from a rare old quarto, a translation of which was published in the last century, and which, from the quaintness of its manner, will be interesting and readable, as well as for the down-right good sense and sound teaching it contains. Much of what I have extracted will be found of great value to the portrait photographer.

The title of the book is "The Art of Painting in all its Branches, Methodically Demonstrated by Discourses and Plates, and Exemplified by Remarks on the Paintings of the Best Masters, and their Perfections and Oversights Laid Open. By Gerald de Lairese. Translated by John Frederick Fritsch, Painter." This book was written long before Reynolds, Gainsborough, and those famous painters who revived the art of portraiture became known to the world. This is what the translator says of his author and his book; he might have been talking satirically of photographic art teaching in our own day:—"The author's known abilities and great reputation in Holland have justly recommended him to the esteem of the most knowing there, I thought it very proper to make him speak English; and the rather (to use his own reason) for that, though many excellent authors have written on painting, yet, in bulk, they seem rather to cry up the art and the artist than lay down solid rules for attainment. To which I may add, that those authors are mostly useless to an Englishman, and few or none copious enough to answer general purpose; nor at best are of general service in England, where fresh and fair nature is preferred before the brown and warm colouring of some other countries, especially Italy, where the best books have been written on the subject. But principally for that I think nothing has been published here so learned, full, and complete, and so well explained by plates and examples as the author will be found to be; nor, perhaps, wherein portraiture (a branch which England mightily affects, surpassing in this particular their mural decorations, which, in the judgment of the judicious, would better have been left blank walls) is so copiously handled."

Passing by some hundreds of pages on pencilling, beauty, ordonnance or composition, colouring, landscapes, &c., let us extract some sentences from Book vii. "Of Portraiture." the subject we have in hand.

Since we meet with no precedence in the art, nor pretend to insist on ceremonies, we shall treat of things as they occur to us, and as clearly and profitably as possibly.

As in music and singing, a good ear is requisite, so in portraiture it is impossible to excel without a good eye; such an one, I mean, as is governed by sedate and sober sensation, and not by self-love and passion. Next, we must be thoroughly judicious in the graceful choice of light, and the place where the person is to sit, that the face may appear to the best advantage; and then the body is to be disposed to the most natural and becoming posture. As for the choice of light, in order to apply it most advantageously for the benefit of either sex, it is certainly a matter of great moment, since the fair sex commonly partake of more delicacy and grace than men, so they must have a light as beautiful and agreeable as their persons.

But our author is heterodox here. He says: "I think those masters have made the best pieces who have chosen a front-light." He should have been painter to Queen Elizabeth. In continuation of the subject of light and shade he mentions some things that should be avoided by those who imitate M. Adam-Salomon.

We see that many, without difference, be the figure in full proportion or in little, give the touches under the nose so black and dark that it seems as if a black beetle were proceeding thence; whereas it is certain, and nature teaches it, that when the light falls strong on the nose, the nostrils and their ground-shades can never appear so black; and yet some think they have done great feats in using force and strength, and will do it even in a fair and tender face, and no bigger than the palm of the hand, although the deepest black should not have force enough to shade the other objects of a darker colour, such as hair, a cloak, or other garment: by which sort of management the face seems to jump out of the frame, and to desert the wig, hair, and garment. We must not so understand when we teach that the face must have the main light; we mean only that all ought to keep due order, that it may look natural.

On dress, accessories, and the management of the sitter, we have the following capital remarks, which are as applicable to photography as to painting. There will be noticed a curious vein of satire throughout. He is rather hard on the ladies.

Self-conceit and self-love seem natural to all, but especially to the female sex, who, whether their pictures are drawn on their own accounts or through the desire of others, imagine they deserve much homage; nor stops it here, for although they may possess a tolerable

share of beauty, yet that is not satisfactory enough, they must be flattered, and their pictures painted in the most beautiful light; and unhappy is the painter who abates but half a drachm of such a beauty.

For these reasons the master is obliged to have a principal regard to light and shade; but to the light chiefly, since it is well known that nothing gives greater offence to ignorant people than shades, and still more when they are strong and broad; they believe they speak to the purpose in objecting: 'Well, how can it be possible that my neck and cheek should have such large shades, when I daily consult my glass and find my skin all of a colour and white?' and then the painter is blamed. But are not such reasons weak and absurd?

It is evident that backgrounds contribute very much to the charming grace of objects; nay, I dare say, that the decorum mostly depends thereon; and though many imagine that a black or dark ground always becomes a portrait, yet it is no rule, since, as before has been said, each individual object requires a particular background; besides, if such things were to be taken for rules, the art would smell too much of an humdrum.

It may not be foreign to our main design to put the artist in mind of the application and right use of such materials as may enrich a portrait and make it look the more noble. This is so great a point in portraiture that when well known we need never be at a stand through the mishap or defects we often meet with in the disposition of a portrait, and which sometimes must not be hid, since we have often means enough for obviating them with seeming reason, and without forcing nature; as a long and narrow face may be helped by a hood or other head-dress; a thick and too round a face by the contrary; a figure too lonesome may be embellished by such things as are proper to it, which serve not only for ornament and grandeur, but also to express the sitter's lustre and virtue; but care must be taken that the figure of the sitter, as the principal object of the piece, fill up the major part of it, either by a spreading away of the posture, or by the addition of some proper by-work, by which means it will have a good effect.

Some persons may be too long and sharp-nosed, or too hollow-eyed; for such, a low light is most proper; but when it is otherwise, an high light. In this manner a judicious master ought to help the defects of nature, without adding to or taking anything from them; yet, to the sorrow of impartial masters, the contrary is too often seen, for with many portrait painters their work is better known by their particular manner than the sitter by his picture.

I think, also, that the common and useful dress of a person is a great addition to likeness; for no sooner is the dress altered but the look does the same, and shows itself either more or less pleasing and agreeable. Some painters keep in their room for the use of all their sitters, be it he or she, without discrimination, certain pieces of cloth and velvet, by which they imitate the Roman manner; but thereby the persons represented become more or less unknown.

The following is capital advice:—

The painter should likewise discover and know, as much as possible, the nature and temper of the person sitting, and in what circumstance lies his favourite pleasure; that he may, when sitting, be entertained with talk pleasing to him, and his air thereby kept steady and serene, and his posture natural and easy; avoiding everything tending towards sorrow or frightful relations; for these are apt to ruffle the mind and so to decompose the face that it cannot easily be got right again; but if the sitter himself do, by his talk, discover his own bent, the painter ought to humour him to the last, whether it be jocose or moderate, without exaggeration or diminution, yet with such a variety as not to prove tiresome and make the face alter.

But to return to the original matter: I must warn the artists not to give in too much to what is common, or humour ignorant people so much as not to reserve to themselves some liberty of doing what they think proper for the sake of reputation. Surely this cannot be strange advice; for a master who prefers money before art has no more dangerous rock to split on, since the ignorant multitude usually insist to be drawn according to their own whims. One says to a good master: 'Draw me thus, or thus; let me have one hand on my breast, and the other on a table;' another must have a flower in his hand, or a flower pot must be by him; another must have a dog, or other creature, in his lap; another will have his face turned this or that way; and some who would be drawn in the Roman manner must be set off by a globe or cloak on the table, whether such ornaments be proper or not. On mentioning the Roman manner, I find that it signifies a loose airy undress, somewhat savouring of the mode, but in no wise agreeing with the ancient Roman habit.

This is admirable and true. The fine gird at the "Roman" manner is capital. In the author's day it was the custom to have portraits and statues habited in classical costume, with, perhaps, the addition of the immense "Duvilliers" wigs of the period, an absurdity that West, greatly daring and against the advice of his brother artists, broke through for the first time in his "Death of Wolfe." This manner of trying to make the sitter look a much finer fellow than he

really is has its counterpart at the present time, even in our own art, and is followed by photographers who *will* defy nature and stick to precedent. As our author says:—

Some painters will keep to the old road, because it is difficult to correct a rooted evil; they do as the old woman did, who, being exhorted in her last sickness to embrace the true faith, answered, 'She would follow the steps of her forefathers, were they all gone to the devil.'

There is a pernicious custom among some inferior photographers of collecting together a set of poses and fitting their sitters to them, or of allowing their customers to select their own, no matter how incongruous the thing may be, so that it is paid for. This is a detestable practice. Photographers should learn the principles of their art, and then invent poses for themselves, instead of cowering in borrowed plumes. The effect is peculiarly ridiculous when the feathers are too fine for the bird, and he endeavours to make a maid-servant look like a duchess. Here would be a time to introduce your column and curtain, if you like! *Laissezse*, with the instinct of a true artist, is very severe on a similar practice.

I have discovered a great oversight in some artists, which is, that when the face is finished, they had no further regard to the life, but chose a posture at pleasure out of drawings and prints, without considering whether it suited the person, and whether the figure was proper to the condition and countenance of the sitter; nay, whether the head matched the body; certainly a great heedlessness. If things be done without making distinction of persons and their conditions, the artist will work to his dishonour. He who steals thus may not indeed call the work his own without reproach. Some will object, as Michael Angelo did once to a painter who practised it with success: '*What will become of your pictures at Doomsday, when the parts shall return to their own wholes, seeing your works are made up of stolen pieces?*'

In another place the writer complains of those who take the designs of others, and, by transforming them, make them their own.

What one artist uses in the distance (he says) the other, that it may not be known, brings forward; and what he has represented in the open air, the other contrives in a dark room. A poor method of concealment, but it is such men's misfortune to be, in this particular, most out of the way when they think they do best; for, wanting the great master's wit, judgment, and apprehension, they have no true notion of his conduct, and therefore are easily misled, and, like *Æsop's* raven, exposed to censure.

I have only given a slight skimming of the contents of this rare old book, but I am overrunning my space, and shall conclude with a bit that might have been written anent the doings of some who write on photography and art at the present time.

We find many artists never pleased with other men's works, but, being full of themselves, despise everything they see, and this, perhaps, on no better bottom than a pique against the artist's conversation, talk, dress, or money, or else because of his greater fame; and yet if ten persons happen to applaud a fine picture of this eyesore master, they will at that juncture chime in with them, to screen their prejudice. And, on the contrary, if but a single person afterwards find fault, they immediately turn the tables against ten others. Again, if a piece of their friend be brought on the carpet, though never so faulty, they will applaud and justify it at any rate, though against their own convictions of conscience, if they have any. But this partial and prejudiced humour is most prevalent in those who know least.

ON THE PRINCIPLES OF LIGHTING AND OF CONSTRUCTING STUDIOS.

BY DR. H. VOGEL.

THERE is nothing of more importance for the professional portraitist than a judicious arrangement of his studio and lighting arrangements. Innumerable faults have already been committed in this matter; enormous sums have been dissipated in curious constructions, which have proved to be impractical in working, and which were found impossible to alter without great loss of money, if possible at all; and notwithstanding these experiences, different opinions still prevail as to the best construction and arrangement of the glass room. "What is the best form, a high skylight or a low one?" is still constantly asked. Art photographers of great influ-

ence utter opinions which are quite opposite to one another "What kind of light has it?" is the first question asked regarding a glass house; and this stereotyped phrase indicates the chief point to be considered in constructing skylights. I shall try to explain the principles of illumination in studios according to physical rules, and, at the same time, I shall review the actual construction of studios generally.

Suppose a room which is enclosed on all sides by walls, and which receives its light through one single window, illuminated only by the light of the clear blue sky. Experience teaches that the brightness of light is different on different spots of such a chamber: the further a point is removed from the illuminating window the darker it will appear; and the nearer it is situated to that window the brighter it will appear. But not only the distance of a point from the window, but also its situation in reference to the window, is of importance. A spot near the wall in which the window is placed will be much darker than a point situated at the same distance from, but quite opposite to, the window.

First of all we must endeavour to explain this. Direct sunlight, being kept out, it is the blue sky alone which affords light to the chamber. A certain point in this room will therefore be the brighter in proportion to the greater portion of the skylight sending its rays upon it. Suppose, for instance, a certain point *a* (fig. 1), opposite to a round window,

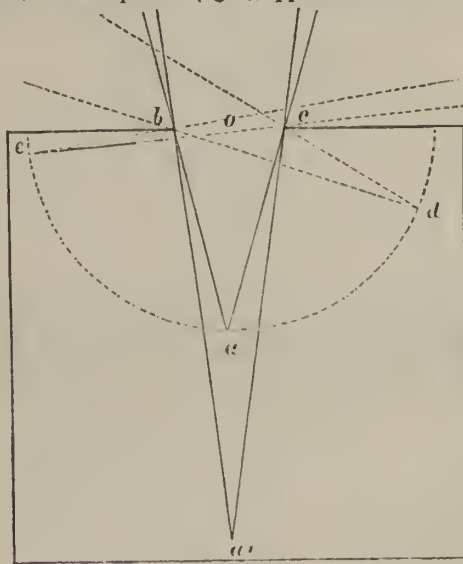


Fig. 1.

it will be the top of a bundle of rays, the diameter of which will be appropriate to the aperture of the window. Suppose a second point, *a'*, at a greater distance from the window: this is illuminated only by the cone of rays *b a' c*, which is much more narrow than the first. The cone of rays which illuminate the point *e*, situated at the side of the window, is still smaller, whence it follows that *a* must be brighter than *a'*, and this brighter than *e*. In consequence of this, the aperture of the cone of rays—that is to say, the angle—formed by the lines which we may draw from the illuminated point to the edges of the window, affords a criterion of the intensity of light for the point referred to. I beg to term this angle the angle of light. If the supposed point be situated within the wall the window is in, that angle of light would only form a straight line, and therefore such a point would be quite dark if it did not receive some light by reflection from the light walls. But it is obvious that not only the dark wall of the window, but also every other point of the chamber, receives such light reflected from the walls, ceiling, and floor. Therefore, every point within the chamber, except the wall with the window in it, will receive

its light from two different sources. It will be illuminated (1) by the direct light of the blue sky, the amount of which is the greater the greater part of the skylight sends light upon the point; (2) by the light reflected from walls, &c., which is of a very complicated nature. Let us for a moment leave out the reflected light, in order to examine the effect of direct light alone. The brightness which this latter affords to a point may be briefly termed direct brightness.*

The direct brightness of a point within a room depends, as already stated above, first of all, upon its position in reference to the window, and consequently on the extent of the latter. In order to examine these points more exactly, we shall start from the most simple hypothesis, and treat at first on the brightness of a point situated directly opposite to a narrow round window. The greater the aperture of the window the greater is the angle of light. If the angle of light be only small, the brightness of a point will be proportionate to the superficial extent of the aperture.

Now, the superficial contents of analogous figures are to one another as the squares of homologous lines; therefore, the intensity of light will be in the proportion of the squares of the window diameters. We mathematically may prove this as follows:—

Suppose that the quantity of light afforded by a certain piece of the blue skylight be proportionate to its area, then the bright-

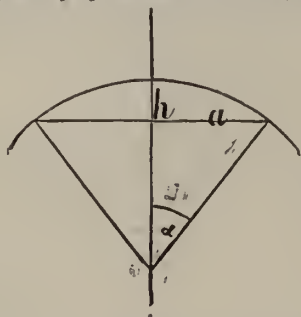


Fig. 2.

ness of the points a a' a'' (fig. 2), situated directly opposite to a round window, is fixed by the area of the spherical part of

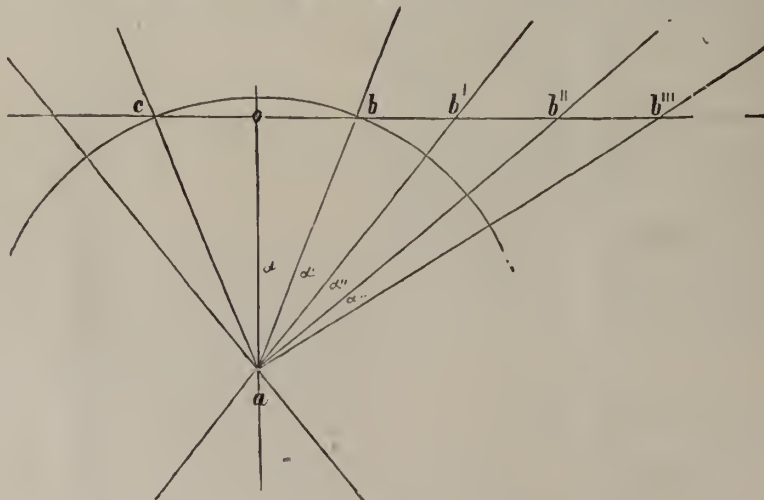


Fig. 4.

veiled with curtains. Half the angle of light is here, a ; the aperture being successively made twice, thrice, and four times as great (cb' cb'' cb'''); the angle of light is only enlarged by the pieces a' a'' a''' , which, as may be seen in our diagram, do not increase so rapidly as the aperture. We

the calotte, enclosed by the cone of light which is formed by the rays. The area J of a calotte is the radius of the basis of the segment, being $= a$, the height $= h$, equal to $\pi (a^2 + h^2)$ (fig. 2). The angle of light being $2a$, it follows—

$$h = r (1 - \cos a).$$

For very small angles we can set—

$$1 - \cos a = 0,$$

whence follows

$$J = \pi a^2;$$

that is to say, the area of a calotte are equal to the basis, while the radius $= a$, if the angle of light is small. Therefore, the

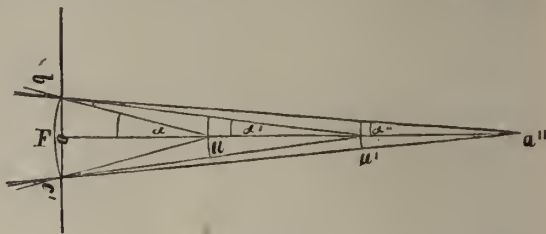


Fig. 3.

brightness of different points, a a' a'' are in the proportion of—

$$\pi a^2 : \pi a'^2 : \pi a''^2,$$

a^2 being $= \sin^2 a$ (fig. 2) the amounts of light of the points a a' a'' are to one another in the proportion

$$\sin^2 a : \sin^2 a' : \sin^2 a'';$$

or, since for small angles the sinus are to one another in the same proportion as the tangents; as

$$\pi \tan^2 a : \pi \tan^2 a' : \pi \tan^2 a''.$$

The tangents are found by dividing F , the radius of the aperture by E , the distance of one of the points a a' a'' ; therefore, the amount of light at a a' a'' are in the proportion—

$$\frac{F^2}{E^2} : \frac{F^2}{E'^2} : \frac{F^2}{E''^2};$$

that is to say, the intensity of light decreases as the squares of the distances increase; and increase in the same proportion as the squares of the radius of the apertures do.

A round or square window of the double extents will therefore afford four times as much light to the same point, and thrice as great window nine times as much light. With larger windows the amount of light increases not so rapidly if the aperture is enlarged. Suppose, for instance, a point a (fig 4), opposite to the aperture cb , in a glass house entirely

* I confess that this is a very bad name, but I do not know another at this moment, and I think it is reasonable.—DR. V.

instantly may apply this to practice (fig. 5). In a studio of 32' of length, place a person, a , at a distance of 5' from the glass wall and 4' from the background, the curtains being closed between g and h . By constructing the angle of light, hag , we receive a criterion of the amount of light at a . The piece cut out from the skylight by the angle hag determines the intensity of light at a . If our studio had a

length of only 24' instead of 32', would therefore i be the end, the intensity of light would be determined by the angle $i a g$, all other circumstances being the same. Already, in the diagram, we see that the two angles $i a g$ and $h a g$ are

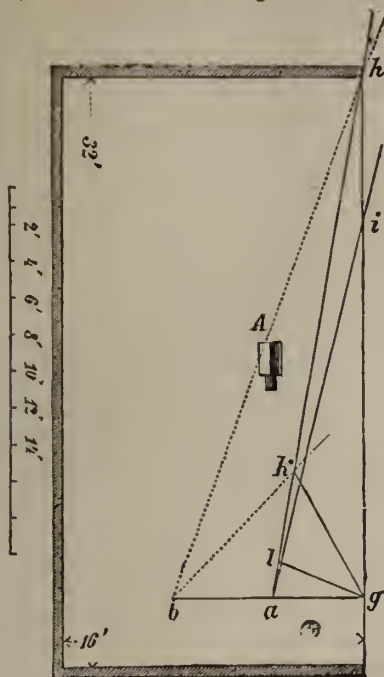


Fig. 5.

not very different from each other, whence follows that, in this case, it would not be of great use to add a piece of eight feet (*i h*) to the glazed wall, especially as a great deal of the rays, falling upon the glazed wall under very great angles, are reflected by the glass.

(To be continued.)

TONING AND FIXING IN ONE BATH.

In a recent interview we had with Dr. Liesegang, referring to Dr. Towler's suggestion to give the mixed toning and fixing bath another trial, he mentioned a formula which he had recently been trying which yielded fine rich, warm, black tones, with somewhat rosy half. He had, he informed us, produced a large number of prints which were now undergoing tests for permanency, the result of which he will duly communicate to us. The formula stands thus:—

Water	2 ounces
Sulphocyanide of ammonium	50 grains
Hyposulphite of soda	240 "
Acetate of soda	15 "
Chloride of gold	1 grain.

Dissolve the gold in a small quantity of water, and add it to the other solution.

The bath may be used immediately after preparing. The prints are not washed before putting them into the bath. They become yellow at first, but afterwards recover their force. The toning and fixing takes about ten or fifteen minutes, but can be continued for some hours.

The acetate may be substituted by the beuzoate, the phosphate, borate, citrate, or any other such salt, for the purpose of modifying the tint desired.

COLLODION WITHOUT BROMIDES.

MR. R. WALTZ, of Boston, sends the following formula to the *Philadelphia Photographer*, as giving results equal to collodion containing bromide:—

Iodide of ammonium	...	...	4 grains
Iodide of cadmium...	...	...	3 "
Chloride of calcium	...	...	1 grain
Cellodion (plain)	...	...	1 ounce.
40 to 50 grains nitrate bath.			

DEVELOPER.

Protosulphate of iron	...	...	1 ounce
Water	...	...	12 ounces
Alcohol	...	...	1½ "
Acetic acid...	...	...	1½ "

Mr. Waitz is now using this process in his daily practice. He finds it to work very quickly, as he is able to secure excellent negatives of children in two seconds, requiring no re-developing. We have inspected several of Mr. Waitz's negatives, the editor of our contemporary remarks, and find them to excel those made by him with bromized collodion.

Mr. J. W. Black is also using the same formula, entirely discarding the use of bromized collodion in his dark room. We saw him make a number of exquisite negatives as large as 11 by 14, full of charming gradation and softness, and fully equal to anything we have ever seen.

It is so simple and so cheap that it will come into general use, doubtless, bromide patent extended or not.

ON A NEW AND SIMPLE METHOD OF RECOVERING METALLIC GOLD AND SILVER FROM RESIDUES.

BY VICTOR G. BLOEDE, CHEMIST.*

To Treat Developer Residues.—The black, muddy mass remaining in the developing sink, or obtained by precipitating with common salt (the precipitate obtained by sulphide of potash will not answer), may be treated by amalgamation, with even better results than can be obtained by the smelting process. To treat this somewhat troublesome compound, proceed as follows: Thoroughly dry the muddy black mass, whether it be from pyro or iron development, and when all moisture is driven off, place it in an iron mortar, and thoroughly pulverize and triturate it; then pass it through a brass-cloth sieve (having meshes about half as large as a fine flour sieve) and place the resulting black powder into a narrow-neck glass-stoppered bottle, adding to each pound of the powder at least half a pound of mercury. Then pour on a sufficient amount of boiling water to make the whole of the consistency of thin cream, and shake the bottle and contents for several minutes. Let the mass remain in the bottle for an hour or two, shaking briskly occasionally, so as to bring the black powder in immediate contact with the mercury. Finally, empty the whole contents of the bottle into a pint evaporating dish, allowing the black solution, which is of no value, to flow off, but taking care not to spill over or lose any of the mercury. To clean the mercury of all the adhering black precipitate, place the dish under a tap of flowing water, and, by careful management, the entire impurities can be quickly washed away. When the mercury has been perfectly cleaned in this manner, filter off the remaining water, place the quicksilver in a piece of buckskin, and proceed precisely as directed in the last.

Another method, which is very much simpler and easier than this, is to place the wet muddy mass, just as it comes from the tank, into a coarse damp cloth, and to subject it to pressure between the hands. By these means all impurities may be removed as readily as by drying and sieving, thus economizing much time and labour. The cleaned black mass may then be treated precisely like the former.

Amalgamation of Paper Ashes, &c.—Paper and filter, as well as cloth ashes may be very successfully treated by amalgamation, providing that they are very thoroughly burnt and reduced. The paper, in saving, should be kept free of all impurities, especially pins and other metallic

substances. Place the paper clippings, &c., into a clean wooden box, and thoroughly sprinkle and impregnate them with the following solution :—

Protosulphate of iron	...	...	2 ounces
Nitrate of potash (saltpetre)	...	...	2 "
Water	...	...	2 quarts

When the paper has been well moistened all through, spread it out, let it dry thoroughly, and finally burn it in a stove having a good draft.

The paper should be added very slowly by the handful, so that the reduction may be complete, which will not be if the flame is at all smothered.

By using the sulphate of iron, any undecomposed nitrate that may exist in the paper, as well as portions of chloride of silver, are reduced to the metallic state.

The ashes should be removed from the stove and spread out upon an iron plate, so that the air has free access to them, and that they can glimmer out. When cold, throw them upon a fine flour-sieve, and separate the fine dust. Any impurities may then be picked out. It is advisable to grind the ashes in a mortar before sifting. When the ashes are very rich, large spangles of silver are frequently found upon the sieve; these should be picked out and added to the fine powder. Place the fine ashes in a bottle and dilute to the consistency of cream with boiling water. Four ounces of mercury should now be added for each half pound of ashes, and the mixture then thoroughly shaken at intervals for about an hour. Finally, empty the contents of the bottle into a small evaporating dish, and wash off the powder as directed in the last case. The clean mercury receives the same treatment as in the two preceding processes. The yield of silver by this process is very large, if the paper has been properly burnt, but any large lumps of chloride of silver in the filters should be removed, as such do not get enough heat to be reduced to the metallic state, and are, consequently, not taken up by the mercury. A large quantity, as ashes, may be readily reduced by this method with but very little trouble and expense.

Reduction of Chloride of Silver.—To properly treat the chloride of silver in the manner I am about to describe it is essential that it be freshly precipitated, or at least, it must not have been dried. Place the pasty mass in an evaporating dish of proper capacity, and add to each half pound about 2 ounces of tacks or other small bits of iron, then dilute until the chloride is of the consistency of thick cream, and add sulphuric acid (oil of vitriol) until a lively effervescence ensues. Allow the mixture to remain at rest for two or three days, after which time the white chloride will have changed to a dark grey mass, consisting of metallic silver and iron. Should all the iron have disappeared at the lapse of this time it is advisable to add a little more, and repeat the process, otherwise dilute or wash the grey powder carefully with water to remove the superfluous acid, and, finally, thoroughly dry the powder and sift it. If any impurities were contained in the chloride they will be upon the sieve, and may be removed. To further purify the silver obtained, place the fine powder in a clean bottle, and pour on enough mercury to dissolve it. The mercury is squeezed through the buckskin as in former cases, and a solid amalgam remains behind.

Another Method.—Another method, which is somewhat simpler than the foregoing, is the following :—Place the newly-precipitated chloride in an evaporating dish, and pour upon each ounce of the chloride from 2 to 4 ounces of ordinary developer, minus the acetic acid, and perhaps a little stronger in iron, and place the dish upon a stove and let it simmer gently, with continual stirring. A very marked change rapidly takes place in the precipitate, from white to black. The dish and contents may then be placed in a light place, and allowed to remain at rest for several days. The superfluous solution should then be poured off, the grain silver washed with water, and the resulting grey powder, after the addition of some hot water, treated with 1 ounce of

mercury to each 2 ounces of silver, well shaken, and finally finished as before directed.

Treatment of Toning Precipitate.—The black precipitate obtained from old toning baths by means of protosulphate of iron solution, and consisting of metallic gold with a large amount of iron, while still wet, must be placed in a coarse cloth previously damped and pressed, to separate any impurities; it is then put in a clean white glass bottle and diluted with boiling water to the consistency of cream, and to each pint of this solution 2 to 4 ounces of mercury added. The mixture should be shaken occasionally, and allowed to remain in the bottle for several hours. After this time the contents of the bottle may be poured into an evaporating dish, and all the black powder (which is now of no use) washed away by a stream of water under the tap. A small amount of amalgam only will remain in the buckskin after pressing, but this is equal to at least ten times the quantity of silver amalgam. It should be carefully preserved and treated in the manner I shall presently describe.

I have thus given in detail a process which, in my hands, has always been an eminently successful one, and which I commend for trial to the profession. With a little experience, the ashes, developer, and toning residue especially, may be reduced with but very little expense, and incomparably less labour than by the furnace and smelting method. Having treated the various residues as I have directed, the next and last step is to drive off the mercury, and thus obtain the precious metals in their pure state.

How to Treat the Amalgam.—Place the buttons of brittle amalgam upon a shallow dish of sheet iron, or upon an ordinary coal shovel, and expose them to a low red heat on a lively coal fire. Great care should be exercised that the cover of the stove fits tightly, and that the dampers are all open, otherwise the very deleterious mercurial vapour will pass off into the room. When the dish containing the amalgam has been at a dull red heat for about five or ten minutes, it may be removed. A button of pure gold or silver, as the case may be, is the result. The high heat in a few minutes volatilizes the entire mercury. When the button of amalgam is large it should be heated for about fifteen minutes, merely for the sake of certainty, as at a full red heat the process is completed in a much less time. When a considerable amount of amalgam is worked up, an iron retort must be made use of to volatilize the mercury, as it is both safer and more economical. It consists of a sort of iron cup or pot, having a closely-fitting cover, from which extends a small piece of bent iron tube. When in operation, the tube is dipped to the depth of about one-eighth of an inch in a basin of cold water, and the iron body, in which the amalgam has been previously placed, is put into a lively coal fire. The mercury is volatilized, and its vapour, coming in contact with the cold water, is re-condensed, and gathers in drops on the bottom of the dish.

PIRACY AND INFORMERS.

SOME time ago we pointed out the dangers which attended a system in which hired spies were engaged to entrap the unwary into acts of piracy; and, whilst strongly condemning photographic piracy, we deprecated the systematic employment of informers whose only object is to secure a conviction and penalties by fair means or foul. A case has just been tried in Dublin in which the unscrupulous conduct of these informers called for the condemnation of the judge, and issued in a verdict for the defendants. A correspondent sends the following cutting from a Dublin paper :—

COURT OF QUEEN'S BENCH, July 4.
(Before Mr. Justice Fitzgerald and a Special Jury.)

Graves v. Mercer.

This was an action by an eminent London publisher of engravings against a photographer resident at Belgrave Square, Rathmines, for damages, for having, as alleged, infringed of the law of Copyright, by selling a copy of an engraving called "Broken Vows," of which the

plaintiff possessed the copyright. It appeared that, in consequence of numerous piracies, the plaintiff employed persons to detect forbidden sales of his engravings throughout the empire, for the purpose of prosecution. Some time ago a person of gentlemanly appearance, named King, an agent employed by the plaintiff for this purpose, called upon the defendant, and pretended to be a hawker of pictures, and to want to buy some from him, to sell again. He gave a reference to some person in the trade, and the defendant desired him to call again, and in the mean time waited upon his "reference" to make inquiries, it being the custom, according to the defendant's statement, for persons in that line of business not to deal at once with strangers, because there were persons who were in the habit of endeavouring to gain access to print-selling establishments for the purpose of prosecuting the owners. When King called again, the defendant told him that his reference was satisfactory, and he accordingly entered into negotiations with him. Several interviews took place. King handed him a list of engravings which he wanted to purchase. These were all copyright. The defendant said, "Do you think any man in his senses would sell you these?" King said he could get them very easily in England. At length he consented to take others, and the defendant gave him a large collection to select from, which he asserted contained no copyrights. While King was selecting, he was called out of the room, and was absent for some time—for five minutes, according to King's evidence; according to the defendant's, for twenty minutes or half an hour. When he returned King pointed to a lot, which he said he had selected from the general collection he was desired to choose from. The defendant, in his evidence, stated that on counting those which King had selected, he discovered that there were several pictures amongst them which he had always considered copyright of late, and which he took to be dangerous to sell. "How is this?" said he; "I find several copyright pictures here." "They were," said King, "in the list that you told me to select from." "I doubt it very much," said the defendant, and asked him whether he had not been looking over some of the others lying in other parts of the room. King said he had not. The defendant said, "Well, in any case, wherever you got them, you cannot have them;" and he accordingly removed them from the lot. Defendant said he sold King four dozen photographs of non-copyright pictures at 18s. per dozen, but denied that at any time he sold him a copy of "Broken Vows." In reply to his counsel, he stated that any "Broken Vows" he had were smaller in size than the one produced on the part of the plaintiff, and alleged to have been purchased from him. He also stated that he had ceased the business of photographing engravings, and now confined himself exclusively to portraiture and landscape work.

The defendant, in reply to further questions, said that on the first occasion when King showed him the list of pictures he wanted, he said, "By the way, there are some of these that I have not got, and others that I have discontinued to sell since the difficulty about copyright arose." He added that he had not sold any copyright pictures during the last year and a-half or two years.

King stated in the most positive manner that he purchased several copies of "Broken Vows," one of which was that produced, from the defendant himself; that he did not steal any of them; that the defendant was present when he selected them; that the defendant saw what they were; that on the occasion when the defendant was absent he was only absent five minutes; and when he returned he only counted the photographs by the corners; and that no such scene took place as that deposed to by the defendant about finding copyright pictures in the lot selected by him, and refusing to let him have them.

A witness named Cattermole deposed that he went with King on one of those occasions, and remained for him outside, and when he came out he saw with him in the bundle he had purchased copies of "Broken Vows," and that when King was going in he (Cattermole) saw that he had none with him, in order that he might swear to that fact.

Mr. Justice Fitzgerald, in the course of his charge to the jury, said he could not commend the stratagem employed by the plaintiff's agent. It was one which no just mind could approve, and he was sure that Mr. Graves himself, now he had heard the facts, disapproved of it. The sole question for the jury, which altogether depended on the credit they gave to the witness, was whether or not Mercer sold to King a copy of "Broken Vows."

The jury returned a verdict for the defendant.

MIXTURE FOR RETOUCHING NEGATIVES.

BY WILLIAM BELL.*

THE exquisite effects of softness and half-tone portrayed in many of the French and German photographs recently imported into this country are secured by skillfully retouching the negatives. One or two processes have been described in your journal, but after considerable experiment I find the

* Philadelphia Photographer.

following an excellent and practical method of preparing the material or pigment for use in retouching the negatives.

As alcohol and oil of lavender are both solvents of most negative varnishes, permit me to caution the experimenter that a rough, hard, or continuous stroke will cut though the negative, unless protected by a coating of albumen before varnishing. I proceed, therefore, as follows:—

After the negative is fixed and washed, flow with a mixture of—

Albumen ...	...	...	3 ounces
Water ...	...	...	3 "
Liquor ammonia...	...	...	1 drachm.

Dry, varnish, and retouch with the following described pigment. All shades can be produced with it so strong that no light can penetrate it; so fine that it will offer but little obstruction to light; and, after drying, cannot be removed except by strong alcohol and oil of lavender mixed. In fact, it becomes incorporated with the negative.

To make the pigment,—

No. 1.—Pyrogallie acid ...	...	...	20 grains
Water ...	...	...	30 ounces.
No. 2.—Nitrate of silver ...	...	...	240 grains
Water ...	...	...	20 ounces.

Add No. 1 to No. 2. Let it rest for two hours. Collect the reduced silver on a filter; wash and dry. When dry, take very thick negative varnish, and make a paste with it and the dried reduced silver. Again dry.

To use the above, take of—

Alcohol ...	...	...	$\frac{1}{2}$ ounce
Oil of lavender ...	...	...	$\frac{1}{2}$ ounce,

and mix them together. Dip the brush in the mixed oil of lavender and alcohol, and moisten the dried pigment. When the touches are put on with artistic judgment, the print from the negative will look like a retouched photograph that has been finely stippled with india-ink.

MORE PIRACY OF ENGRAVINGS.

MR. JOHN HALL, a hawker of photographs, who has before been convicted of piracy, was last week charged before Mr. Tyrwhitt, at Marlborough Street, with selling a photographic copy of "My First Sermon," and some other pictures, the copyrights of which were the property of Mr. Graves.

Mr. George Lewis, Jun., appeared for the prosecution, and said that Mr. Graves's object was not so much to punish the prisoner as to discover the originators of this fraudulent system. One person who had infringed the Copyright Act had been sent to prison for nine months by Mr. Woolrych, and the judges had upheld the decision. He had to ask that the prisoner be kept in custody until Monday, as Mr. Graves wished, if possible, to find out with whom the prisoner was acting, the fraud having been carried on a large scale. He had been for some time looking after the prisoner, and had advertised for him in the *Times* and *Photographic News*.

Mr. Tyrwhitt said it appeared to him there must be a large profit made out of this business.

Mr. Lewis stated that Mr. Graves had already spent £1,000 in tracing out this affair.

Mr. Graves having identified the prisoner, and said that he had been twice convicted at Bow Street, and each time fined £50, the prisoner was remanded until yesterday (Monday).

Mr. George Lewis, Jun., appeared for the prosecution; and Mr. Pullen for the prisoner.

Mr. Sutton, of Harrow, said, on the 27th of December last he was at Portsmouth, and saw the prisoner at North's Hotel, High Street. He had some conversation with the prisoner, in the course of which the prisoner offered him some photographs for sale, recommending them as cheap and good. He purchased one copy of "Morning Before the Battle," and a second of "Evening after the Battle." The prisoner told him he did not mind selling them to him, as he was a gentleman. On the 29th he purchased a copy of "Finding the Text," and of the "Good Shepherd." Afterwards he purchased a copy of "Waiting for the Verdict" and "The Acquittal," also "My First Sermon," "My Second Sermon," "Ordered on Foreign

Service," and "The Lost Piece of Money." The purchases he now produced; they were photographs of engravings and works the property of Messrs. Graves and Co. The prisoner travelled through the country selling these kind of photographs.

John Cattermole, in the employ of Mr. Henry Graves, said he was at Portsmouth on the 25th November, when the prisoner told him that he was the Mr. Hall who had lately been fined £75. He asked the prisoner to sell him some photographs, and the prisoner told him he could have them through Mr. Sutton.

Mr. Boydell Graves produced the certificates of the registration of the pictures above-named, and stated that, either directly or indirectly, the photographs produced were copies of the originals. The prisoner sold the photographs at about one-third the price of a genuine copy.

In reply to Mr. Pullen, Mr. Graves said he could not produce the assignments from the artists, in consequence of their destruction by the fire in the Haymarket.

Mr. Pullen took a legal objection on this point, but it was overruled.

Mr. Trywhitt could have no hesitation in ordering the prisoner to pay the penalty of £5 for each spurious copy sold by him, or a month in each case if default occurred. The trade of pirating copies appeared to be a very profitable one to some persons, and he had no doubt the prisoner would not be inconvenienced by the penalties he was now called upon to pay.

The penalties and costs, amounting to £51 2s., not being paid, the prisoner was locked up.

SEPARATING GOLD FROM SILVER.

THE *Scientific American* gives the following description of the method employed in separating gold from silver in the United States Assay Office:—

The mixture of gold and silver is melted, and poured into water, by which it is granulated. The granules are placed in porcelain jars containing nitric acid. Heat is then applied, and as the acid boils, the yellow fumes, which our readers have doubtless so often seen proceeding from the chimney of the Assay Office, are given off. This process goes on for about twenty-four hours, when the jars are emptied, and in the bottom is found a brown substance resembling mud or anything else upon earth rather than "gold—glittering gold." It is, in fact, however, pure gold, or, at least, very nearly so. The silver has been dissolved by the nitric acid, and is in solution. It is carefully put aside for future treatment, for in the Assay Office nothing must be lost or wasted. The brown substance found at the bottom of the jars is placed in large wooden tubs and washed by percolation in warm water until all traces of acid have disappeared, and it is said to be "sweet."

The gold is then of .940 fineness. Formerly it was subjected to a second boiling in nitric acid, which left it about .993 fineness, but by the process at present in vogue it is treated with sulphuric acid, by which a fineness of .998 is attained. This is termed pure gold, although it is not actually so; but to deprive it of the two parts of alloy it now contains would involve an expenditure of time, money, and trouble altogether useless. After its treatment with sulphuric acid, the gold, which still looks more like red mud than a precious metal, is again washed until "sweet." It has now a reddish yellow line. After being dried, it is taken to a hydraulic press, where it is made into "cheeses," so called from the colour and shape. The cheese made in the Assay Office is richer far than the most fertile vales of Gloucester ever produced. Each "cheese" is about thirteen inches in diameter, but it is worth about 20,000 dollars. These cheeses are baked in an oven heated by steam until all remaining moisture is expelled, when they are remelted, cast into bars or bricks, assayed, and stamped with the weight, fineness, and value. And now they look like gold indeed.

The reader will remember that the nitric acid poured

over the gold and silver granules, in the porcelain jars, and now containing a large quantity of silver in solution, has yet to be disposed of. A solution of chloride of sodium—common salt—is first added to the solution, and a deposit of white powder is the result. This powder is chloride of silver. The next process is to free the chlorine from the silver, and this is done by placing it in vats with granules of zinc. The chlorine and zinc readily combine, and the silver is set free in the form of a light grey powder. This, like the gold, is washed, pressed, and formed into "cheeses" worth 800 dollars each. These are melted, weighed, stamped, and ready to be disposed of as occasion may require. The silver obtained by the above process contains but one part of alloy in 1,000. Some silver is so pure that it requires no "parting," and, after being assayed, is sent at once to the Mint.

The Assay Office was established in this city in October, 1854, and since that time over 160,000,000 dollars have passed through the hands of its officers.

Correspondence.

CARRIAGE OF PHOTOGRAPHIC GOODS ABROAD.

DEAR SIR,—Finding it impossible to forward collodion or any liquid, however innocent, by the Overland Routes to India and the Australian Colonies, through the false fear as to its liability to explosion, &c., existent in the minds of the directors of the companies who work these routes, and it being a great inconvenience to my customers to have their goods forwarded by sailing vessel round the Cape, I think it quite time some steps were adopted to abate the nuisance. Knowing thoroughly well the properties of collodion, you will, I think, agree with me, that when packed securely in tins, and, in addition to this, enclosed in a tin-lined case, no possible harm to other goods could ensue from contact on board ship. May I therefore ask the benefit of your valuable assistance in this matter, as it not only concerns me and other dealers in photographic requisites, but is of great moment to those who practise photography abroad?—I am, sir, your obedient servant, J. SOLOMON.

London, June 26th, 1868.

[The inconvenience involved by this determination on the part of the overland carriers is undoubted. With careful packing no serious risk need be involved; but the only remedy we can suggest is combination between the manufacturers and dealers to make such representations and place such pressure on P. and O. Company as shall induce them to relax the stringent rules in question.—ED.]

PANORAMIC CAMERA.

DEAR SIR,—Will you allow me, through the medium of the NEWS, to give a description of a panoramic camera which anyone with a little ingenuity can construct for himself.

It consists in using a dark slide belonging to a Latimer Clarke's stereo camera, fitted on to the end of a quarter plate camera, and focussing the right-hand side of the intended view, and taking it on the left-hand end of a stereo plate; then turning round the camera to embrace the left-hand of the view, and taking this on the right-hand end of the same plate. You have a panoramic view about 6 by 3, only it has the disadvantage of showing a slight line down the centre of the view: but I am in hopes this can be remedied, and if I should succeed in doing it, I will send you full particulars and a print or two.

By blocking out the sky the join is very little seen, and altogether it is better than taking a view on two negatives and joining the prints.—Yours truly, THOMAS GULLIVER.

18, Union Street, Swansea, July 7th, 1868.

[The plan suggested by our correspondent, to whom photographers are indebted for many ingenious suggestions, has before been applied. Mr. Penny, of Cheltenham, some years ago sent us an example in which no traces of the junction of the two halves of the image is perceptible. Mr. Woodbury also, some years ago, sent an example from Java to the Manchester Society.

Talk in the Studio.

POISONING BY NITRATE OF SILVER.—The *Union de la Sarthe* relates the following:—"The Abbé Salvy, vicar of Senonches, had been appointed to the Church of Saint-Denis-des-Fuits, in the Canton of La Loupe. Three inhabitants at the latter place arrived at Senonches to remove his furniture. The Abbé placed some bottles of cider in a corner of one of the waggons to refresh the men on the journey, and with them he brought a smaller bottle, well covered and tied up, which he told them they must not touch or permit any one to touch. The day being very hot, one of the men said, 'That must be right good stuff which the curé told us not to touch.' 'No doubt,' replied another, 'it must be far better than the cider.' 'Let us try it,' said all three. The bottle was produced. The man who took a good sup said it was not good. 'See,' said he, handing it to one of his companions. The second tried, and pronounced a still more unfavourable opinion. 'As it is so bad,' said the third, 'I shall not have any; let us put back the bottle.' Scarcely was this done than the two who partook of the liquid fell on the ground writhing in dreadful agony. In a short time both were dead. They drank a solution of nitrate of silver, which the abbé used for photographic purposes." In case of the accidental swallowing of nitrate of silver solution it should be remembered that a strong solution of common salt is the immediate remedy. The nitrate is by its aid converted into insoluble chloride, and is generally in this state got rid of by vomiting.

MONUMENT TO FARADAY.—The Royal Society has memorialised Her Majesty's Government in favour of the erection of a monument in Westminster Abbey to the memory of Faraday, at the public expense.

MOULDS FOR THE GALVANOPLASTIC PROCESS.—When the objects to be gilt, silvered, or coppered are of large dimensions, gutta-percha cannot be employed for moulds without much difficulty. Herr Kness recommends in this case the use of an artificial mixture which is obtained by melting together 6 parts of white wax, 2 parts of asphalt, 2 parts of stearine, and 1 part of suet. When the mixture has become perfectly homogeneous, lampblack is added, until the mass takes a fine black colour; finally, to give more body to the compound, and to prevent it adhering to the object, a small quantity of finely-pulverised plaster of Paris is added. The models must be previously covered with a thin layer of oil. The above mixture is then run on to them at a moderate temperature. If the latter is too high, the mixture adheres to the model. When cold, the composition is easily detached from the original.—*Scientific Review.*

CRYSTALLINE PAPER.—Puscher's process for ornamenting paper with silky crystals is to mix the gum made by heating commercial starch to 320° Fahrenheit, known as British gum, with equal parts of Epsom salts and of water, to which is added a small quantity of glycerine. After being brought to the boiling state the mixture is immediately strained. While yet coated with a thin solution of glue or gelatine. The paper, on warm it is spread with a camel's hair brush upon paper previously being dried, presents a beautiful crystalline surface. The size of the crystals may be varied by altering the strength of the solution, and by drying the paper more or less rapidly. Crystals of different tints may be made by mixing aniline colours with the solution, and preparing the paper with the white of eggs instead of gelatine.—*Ibid.*

A NEW OPTICAL TOY.—A new optical toy, called the kine-scope, is being made in Paris. It is a microscopic reproduction of the zoetrope, so well known with us. Its most remarkable feature is, that the objects in motion appear solid. This is obtained by making use of microscopic photographs encased in a little apparatus something like a Stanhope lens, and destined to be worn attached to the watch chain as an ornament. The effect of motion is produced by the rapid change of position of two images only. The little instrument, or ornament, forms an elliptical medallion, and the two photo-microscopic cylinders occupy the centre, being perpendicular to the thickness of the medallion. They represent the same object in two positions. The effect is produced by a very simple mechanism. The two photo-microscopic cylinders are encased in a guide surrounded by a caoutchouc membrane, on which is placed a vertical rod terminating in a button, which is outside the medallion. On

looking through the central aperture of the medallion one of the images only is seen; but in pressing the button with the finger, which pressure is communicated to the caoutchouc membrane, the relative position of the two cylinders is changed, and the second image succeeds the first before the latter has ceased to affect the retina.—*Ibid.*

CRYOLITE GLASS.—By melting 1 part of the mineral cryolite with 2 to 4 parts of pure silica, a beautiful kind of glass is formed; we believe it is the same to which the Americans have applied the term cast porcelain. The product is susceptible of being cast in a mould, it will take a fine polish, and can be manufactured into a great variety of useful and ornamental articles.—*Ibid.*

A HANDSOME STUDIO.—The *Liverpool Daily Courier* gives a long and interesting account of a new photographic studio recently opened by Messrs. Vandyke and Brown, in Liverpool. An extract from the description will interest many of our readers. The general style of the arrangement and decorations is described in "form and colouring as Pompeian, but there is an intermixture of Egyptian ideas in the lotus symbol on the staircase walls; of ancient Greek decoration in the key pattern of the borders and some of the stained glass designs. and of modern Greek ecclesiastical ornament in the very effective gas standard at the foot of the stairs. No violent anomaly, however, is apparent: the whole harmonizes and the general effect of the 'grand Pompeian entrance-hall,' as it is termed, is decidedly agreeable. Of the luxurious appearance of the general reception-room, and of the ladies' boudoir attached, we can only speak superlatively, and say that, in the latter apartment especially, there is an air of magnificence which is only not regal because of the evidences of 'business' which lie scattered about, in the shape of exquisitely finished portraits in every style, from the tiny medallion to the enlarged cabinet picture for display after the manner of the old orthodox family portrait in oil. The operating-room, or studio, is said to be the largest in England; it is fitted with every known improvement in the various matters already indicated, and the numerous other workrooms for finishing and mounting are on the same complete scale."

To Correspondents.

REDCAP.—A great variety of materials may be used for a curtain in a photographic studio, each of which will yield a good result, so that it is quite impossible to say which is best. It depends entirely upon circumstances, upon the effect you want, upon the character of the other accessories, and upon the kind of light in the studio. Tabaret is a good material, so is repp; perhaps nothing is better than velvet; cotton velvet answers well, and is cheap. The colour may be green, dark blue, maroon, or a sober tint which does not come out too light. You will doubtless be able to get the proper article from a local draper.

ENAMEL.—From a hasty examination of the cards we do not think that they contain anything injurious to the photograph. More time and careful examination would be necessary for a decided statement.

A. B.—Some samples of paper are undoubtedly more prone to meanness than others; but the actual cause is generally the state of the toning bath. If your acetate bath tones slowly, it is probably due to the use of an impure sample of acetate of soda. You will at least be free from the meanness when the toning is slow. Try the addition of a few drops of a fresh solution of gold if you wish to accelerate the toning. The brown precipitate you describe is the result of something having been introduced into the bath which should not, either by want of cleanliness or in some other way. Are you quite certain that your fingers had not touched hyposulphite and then touched the toning solution? or that the dishes had not been used for washing prints? Hard water is *not* pure water, and when water is very hard it usually contains a variety of lime salts; what, it is impossible for us to say. Use for your toning bath distilled water. By chalk we mean carbonate of lime. You had better procure it of a chemist. A bath made with it will usually keep, if placed in the dark. Strengthen by adding fresh concentrated gold solution and a little hot water. Read Mr. Bovey's recent article on toning.

YOUNGSTER.—An orange or deep yellow is best. If the light be quite non-actinic you may have plenty of it without danger. The use of light yellow calico or glass gives an admixture of white light which is dangerous. 2. Do not paint, but varnish, the wooden trough. 3. It is the practice of photographic colourists of the

present day to use albuminized prints for colouring; but, to a person more familiar with ordinary water-colour drawing than photographic colouring, plain salted paper will present the least number of difficulties.

JOHN HILLEY.—There will be an agent, we believe, for M. Carrier's paper in this country, which will doubtless be duly announced. We cannot say at present whether any greater permanence is promised by his process. 2. We do not know of any practicable carbon process besides Swan's. The method proposed by M. Marion would be, we believe, an infringement of Mr. Swan's patent. Mr. Blair has worked with praiseworthy perseverance at carbon printing, but we do not know of any practicable process he has proposed which might be used as a substitute for Swan's. 3. The patent rests chiefly, we should say, on the use of a distinct tissue which permits printing on one side and washing away on the other, and on the modes of transfer employed. We do not know of any one who touches carbon printing.

E. MORGAN.—You will find the formulae you require in any good manual of photography or in any of our YEAR-BOOKS. The cause of the discolouration of your toning bath is probably contact with dirty fingers, especially with fingers which have touched hypo; or possibly the use for the toning bath of a dish in which prints have been washed, to which some trace of hypo may cling. Our engagements do not permit us to answer questions of this kind privately.

T. P. (or some similar initials very carelessly written).—The prints enclosed are pretty good, and the negatives are not bad, but a little under-exposed. We cannot give you any idea of what salary you might obtain or be worth.

AN ENQUIRER.—The construction of your studio will doubtless have to be subject to the control, in certain respects, of the local authorities. Different towns are under different forms of local government, and all public buildings must conform to certain conditions laid down by such government. In your case it is probable the Board of Health will possess such power. As a rule, wooden buildings are not permitted, because of their liability to fire.

B. N. P.—The strength of the ethereal solution of wax is not important, the chief object being to obtain on the plate an almost imperceptible film of wax, which, being a neutral substance, prevents chemical action from any dirt on the glass. The use of wax for such a purpose is an old idea, but how old we cannot with certainty say. About four years ago it was proposed by Mr. Wenderoth to be applied to the glass to aid in transferring operations. Mr. Henry Cooper at that time called especial attention to its value in giving immunity from the influence of dirt. Its subsequent recommendation for use on dry plates of course was not original. The remarks and the ignorance to which you refer were alike characteristic, but are not worth comment.

VERITAS.—The lighting of the figures is pretty good; in Nos. 1 and 3 the negatives have been over-intensified. In all, the tone is good of its kind, but is blacker than we like. We cannot give you much information as to the chances of obtaining a situation, such questions being somewhat out of our province.

THOMAS STOTHARD.—The deposit of silver on the sides of the bottle holding the printing solution is due to the presence of organic matter, such as albumen, which has a tendency to reduce silver, especially if white light has reached the bottle.

DR. STANTHURPE.—It is important to remember that the only light which is of any real value in illuminating the sitter is that which falls directly upon him from the sky. To ascertain how much of this reaches the model in your studio place yourself in his position and note the amount of the sky which you can see. We fear, from the diagram, that much of the light which enters your studio does not reach the sitter directly. The top-light is not sufficiently in advance of the sitter, but is directly over-head; and the still more important side-light will scarcely reach him at all, being cut off by the projecting portions of wall belonging to the folding doors. If these could be removed, and the side windows extended laterally on the north side, and also taken quite to the eaves, you would gain much additional light of great value in illuminating the figure; or, failing that, if you could extend the north window at E an advantage would be gained.

J. C.—Pinholes may proceed from a variety of causes, of which the most common is the excess of iodide of silver present. We cannot from any general description of results indicate the precise cause. The only mode in which a defect can be traced home to its cause consists in a series of exhaustive experiments, beginning with the most simple and probable sources of error. Read the chapter devoted to the subject in our YEAR-BOOK. Especially try the plan of keeping the bath cool by placing it in cold water, or tying a wet cloth round it.

FOURTH VOLUME.—The task of copying coloured drawings on old discoloured parchment is rather a difficult one, and probably several essays will have to be made before succeeding. Use a collodion containing a full proportion of bromide, expose well in as good a light as possible, and develop with a weak iron solution.

C. A. S.—The affinity between gold and chlorine is very slight, and

the slightest excess of heat will drive off the chlorine and leave metallic gold. From your description it appears that a portion of the gold is converted into protochloride of gold, which is insoluble in water, and is often decomposed by its throwing down metallic gold. Take care in evaporating to preserve a low temperature, and before the evaporation is complete be content with a slightly acid solution, and neutralize with carbonate of lime. 2. Mr. McLachlan resides at Manchester. The sample of nitrate of silver he prefers was found on examination to be pure nitrate of silver. 3. You can obtain nitrate of magnesia of your London dealer; or you may make it by neutralizing nitric acid with carbonate of magnesia. 4. We cannot decipher your question as to citric acid.

W. J. A. G.—Matt silver stains are of various kinds, and spring from various causes. The character and form of the stain afford some clue to the cause; but you do not describe the exact character. If they run from the edge of the plate it is probable that they arise from contact between the nitrate of silver and the inner frame of the dark slide, and that is a more common cause than is suspected. We can only counsel you to read the various articles which have appeared on the subject in our last two or three volumes. Be careful to wash the inner frame very thoroughly; let the plate rest on blotting-paper; use a somewhat weak bath; and avoid the use of a horny, repellent collodion. We shall have something more to say on the subject in an article next week. We prefer 2, 4, or 5 of the collodions named.

SILEX.—We are obliged by the sample of carbon printing you have forwarded, and we shall examine the matter carefully. So far as we have had time to give to the matter at present, we find your description quite correct; but it also appears to us that the edge of the white card on which the discoloured portion is mounted has become somewhat yellow, indicating that the same cause has acted on the card which has tarnished the purity of the print. 2. The damaged collodio-chloride print is a charming picture. The cause of the film splitting and leaving the paper is partly due to the use of unprepared paper, but still more to the use of an unsuitable sample of collodion. It gives a film of the horny contractile kind, which readily splits. A more powdery, adherent sample should be used. The high glaze of this sample at once indicates the horny character of the film. A more powdery sample would give a surface with more of the matt character. We have met with splitting films, but it is a difficulty we have removed at once by using a suitable collodion. We shall have pleasure in seeing a perfect print from the same negative. Thanks for the paragraph, which we shall have pleasure in using.

J. H. BRUCE.—Thanks.

THE DEFENDANT.—A report of the matter was in type when your communication reached us. It shall have our attention.

The continuation of Lieut. Waterhouse's Articles on "Photozincography," and several other articles in type, are compelled, from the pressure on our space, to stand over.

Several Correspondents in our next.

Photographs Registered.

- MR. S. GLEN PAYNE, Aylesbury,**
Photographic Group of Dr. Newham's Winslow Band.
Photographic Group of Mr. and Mrs. Willis's Bridal Party.
Photographic Group of Mr. and Mrs. Willis's Wedding Party.
Photographic Interior of Monks' Risboro' Church.
- MR. NIND, Birmingham,**
Photograph of Mr. and Mrs. Joshua Poole and Mr. Poole's Father.
- MR. G. TEAGUE, Swansea,**
Photograph of Prisoners working the Swansea Treadwheel.
- MR. H. BERLOW, Bradford,**
Photograph of Bradford Old Dungeon.
- MR. D. B. EVANS, Newport,**
Photograph of Usk Lighthouse.
- MR. H. ROBINS, Landport, Hants,**
Photograph of King Theodore's Horse.
- MR. J. H. JEWELL, Westerham,**
Three Photographs of Col. George Ward, London R. Volunteers.
- MR. J. PINDEX, Waterford,**
Four Photographs of Rev. J. Johnson.
- MR. J. STUART, Glasgow,**
Three Photographs of Rev. A. Bruce.
- MR. G. W. UNWIN, Walkley,**
Photograph "The Pet Lamb."
- MR. C. MOLE, Birmingham,**
Two Photographs of Murphy, the Lecturer.
- MR. A. GARNIER, Guernsey,**
Twelve Photographs of Victor Hugo.

All Communications for the Editor to be addressed to 15, Gough Square, Fleet Street, London, E.C.

* All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 515.—July 17, 1868.

CONTENTS.

	PAGE
Prevention of Stains on Negatives in Hot Weather	337
Sensitive Albuminized Paper Preserved Ready for Use.....	337
Recovery from Cyanoide Poisoning	338
The Coffee Dry Process	338
Pictorial Effect in Photography. By H. P. Robinson.....	339
Photo-zincography in Practice. By J. Waterhouse, R.A.....	340
On the Principles of Lighting and of Constructing Studios. By Dr. H. Vogel	342
On the Action of Bromine upon certain Ethers. By MM. A. Ladenberg and H. Wichelhaus	343

	PAGE
An Easy Mode of Obtaining the Position and Focus for Field Views. By W. Campbell	344
New Red Colouring Matter	344
Scientific Gleanings	345
Correspondence—Informers and Piracy—Mr. Bovey's Mode of Toning—Landscape Backgrounds to Portraits.....	345
Talk in the Studio	346
To Correspondents.....	347
Registration of Photographs	348

PREVENTION OF STAINS ON NEGATIVES IN HOT WEATHER.

THE recent hot weather has brought into operation the train of summer difficulties with which photographers are familiar. Matt silver stains and other markings—the result of the silver solution drying or concentrating on the film if the plate be kept more than a few minutes before developing—pinholes, and similar troubles, have been prevalent, as we learn from the letters of many correspondents. We do not intend here to enter into a re-discussion of the various remedies which have been proposed and tried with more or less of success. For information on almost every form of the defects in question, and for details of the various remedies, we must refer our readers to many articles published in our previous volumes.

We wish now to call attention to the practical working of one of the remedies for matt silver and other stains, which we recently saw in very efficient operation in the establishment of Mr. Hughes, at Ryde. The remedy in question consisted in washing the excited plate in distilled water as soon as it was removed from the nitrate bath. This, it will be said, is not new; and the observation will be unquestionably true. The novelty and the especial efficiency consist in a very small item in the operations. When a plate has been washed in this way it is necessary to restore the free nitrate which has been removed to aid in the operation of developing. Two or three modes of effecting this have been tried. One method consisted in adding a little free nitrate to the developer. The disadvantage of this method was a tendency to irregular and patchy development; and unless the plate had received considerably longer exposure than it would have required when unwashed, a hard, under-exposed negative has been the result. A more even development has been secured when the plate has been covered with a little of the nitrate solution previous to applying the developer, and a better result still when the plate has received a momentary redip in the nitrate bath prior to development. But still it has been found that an unusually prolonged exposure was necessary to secure a good negative, and an impression has prevailed that a washed plate was less sensitive than a wet plate in its normal condition. That this impression is erroneous we have recently had opportunity of proving satisfactorily. The whole secret of success depends on the time the plate is permitted to remain in the bath on redipping: sufficient time is necessary to permit the film to become thoroughly permeated again by the nitrate solution. It seems that each atom of impressed bromo-iodide of silver requires the contact of free nitrate of silver in order that the proper reduction may be completed by the developer. The plate which, receiving only a momentary redip sufficient to cover its surface with the silver solution, would yield a thin, hard, under-

exposed image, will, when left sufficient time in the bath in redipping, yield a fully-exposed, detailed, and vigorous negative, always exquisitely clean, uniform, and free from defect. The time which the plate should be left in the bath in redipping in order to secure these results is from forty to sixty seconds. The first plate so treated in our presence was of large size (14 inches by 10 inches), and was kept upwards of an hour on an excessively hot day; but it developed satisfactorily, giving a clean, detailed, and vigorous negative. Any tendency to drying of the film is, of course, unimportant, as the whole becomes uniformly saturated again with the nitrate solution.

Many photographers will not care to undertake this extra labour, except in cases where, from any cause, long keeping of the plate between exciting and developing is necessary; but it may be used, nevertheless, without much trouble, by all who suffer from matt silver and other stains in hot weather. The operation is simple: it consists in the use of a dipping bath of distilled water, into which the plate is plunged as soon as it has acquired a creamy film in the nitrate bath. Immersion for a minute or two in the distilled water, with agitation of the plate, gives the film sufficient washing, and the same bath of distilled water may be without disadvantage kept in use all day, and, if necessary, used for two or three dozen plates.

Practically, it would follow that the plates immersed in the bath which had already washed a few dozen plates are in reality placed in a dilute nitrate bath, another mode of securing immunity from many of the troubles of hot weather. Some years ago we recommended the use of a second new uniodized nitrate bath as a means of getting rid of pinholes and stains. We found, in the course of the experiments made at that time, that after exciting the plate in the usual way, immersing it in an uniodized 10-grain nitrate bath secured immunity from many difficulties, and yielded on development a perfectly good negative, without redipping, the weak silver solution serving every purpose necessarily in the operation of development, having, perhaps, a tendency to give more detail and less density than when a stronger solution was present. During the prevalence of the extremely hot weather we recommend the attention of these suggestions to any of our readers who are troubled with stains and other defects which are brought about by high temperature.

SENSITIVE ALBUMINIZED PAPER PRESERVED READY FOR USE.

WE were favoured a few days ago by a visit from M. Romain Talbot, who introduced to our attention some samples of M. Carrier's preserved sensitive albuminized paper, which is stated to keep indefinitely without deterioration, and without requiring any especial care in its

storage beyond the matter-of-course necessity of darkness. It is stated to be unalterable at all temperatures, and to be quite unaffected by humidity in the atmosphere.

Time will be a necessary element in presenting our readers with the results of our own experience with the sample of paper left in our hands, but we may briefly mention such facts as are before us. The paper is apparently *Saxe*, and possesses a good albuminized surface. We are informed that it has been sensitized some months, and it is perfectly purely white without the slightest indication of discolouration, or tint of any kind. Some prints which have been printed some months, but not toned or fixed, are equally unsullied and pure in the whites. The colour of the image is of a mauve or lavender tint, and on proceeding to print upon the paper we obtained an image of similar tint. The time of exposure was, as nearly as we could estimate, about the same as for ordinary albuminized paper. A special toning bath is recommended, which as yet we have not tried. It consists of—

Common water	...	...	...	1 litre
Chloride of gold, or, better still, the double chloride of gold and potassium	...	...	...	1 gramme
Chloride of cadmium	...	...	4 to 10 grammes	
Sulphocyanide of ammonium	...	...	100	"

This, in round numbers, gives 1 grain of chloride of gold, 10 grains of chloride of cadmium, and 100 grammes of sulphocyanide of ammonium in a little more than 2 ounces of water. The prints are to be fixed and washed as usual. The prints we tried in an old toning bath we had ready gave a variety of good tones, the whites of which remained very pure and brilliant in all cases. So far as we can judge from the hasty experiments already made, the paper is better suited to vigorous negatives than soft ones, rendering, with much delicacy, all the gradations in negatives usually yielding hard pictures: with a soft negative the prints we have tried lacked vigour. There is clearly no free nitrate present; but whether any other salt, except chloride and albuminate of silver, we have not yet ascertained. We shall test the paper from time to time, and report on its continued keeping properties.

The convenience, especially for amateurs, of possessing sensitive paper which will keep good indefinitely, and is always ready for use, is doubtless very great. The price is a little more than double that of ordinary albuminized paper. A preserved sensitive matt paper at a still higher price is mentioned, but we have not seen it nor any pictures produced upon it.

RECOVERY FROM CYANIDE POISONING.

A CASE of violent poisoning by cyanide of potassium or prussic acid was treated with great success on a recent occasion at King's College Hospital. A little boy about six years of age, the son of Mr. Spooner, a hatter in Holborn, was brought to the hospital in a comatose state, with rigid spasms of the muscles of the jaw, so that the mouth was closed and the teeth firmly clenched. It appeared that he had been drinking from a bottle containing a fluid labelled "Warranted not poisonous," which, on analysis, however, was found to contain a large quantity of the poison in question. The child was admitted to the hospital within ten minutes of its having swallowed the liquid, and its mouth was at once forced open, by means of a spatula, sufficiently wide to allow of an emetic of mustard and water being administered; the patient's throat was likewise tickled with a feather, but neither treatment was sufficient to produce vomiting. The house-physician then reluctantly had recourse to the stomach-pump, forcing the mouth wide open by means of an instrument, in order to introduce the apparatus. The stomach was well washed out, and all the poison contained therein removed, so that the object yet to be attained was to keep the patient alive until such of the

poison as had already been imbibed by the system was eliminated by the lungs, &c. As the child was evidently sinking, the limbs becoming quite rigid and blue, it was quickly undressed and placed alternately in a hot and cold bath, which had the desired effect of partially rousing the patient. After treatment in this manner for about twenty minutes, the child again began to succumb, and artificial respiration was then tried, in conjunction with constant friction of the body towards the heart, to keep up the circulation. This was continued for some time, and afterwards a galvanic battery was placed in connection with the limbs, and a current of some intensity administered. By this means the patient was just kept alive, and while still in a very precarious state it was put to bed with mustard poultices applied to the feet. After a period of five hours from the time of its being taken ill, the child began to show signs of consciousness, crying out from the pain caused by the poultices; and in a few hours more all effects of the poison had totally disappeared.

THE COFFEE DRY PROCESS.

We printed a short time ago an account of some comparative experiments with dry processes by Dr. Towler, in which he found, contrary to the experience of many others, that coffee plates did not keep well. Col. Baratti, the originator of the process, points out, however, in our Philadelphia contemporary, that the coffee process described by Dr. Towler essentially differs from the process of the inventor. He says:—

"Dr. Towler takes—

Water	...	...	...	5 ounces
Coffee, roasted and ground	...	...	...	6 drachms
Loaf sugar	...	...	...	3 "

Boil the mixture for five minutes, then allow to settle, &c.; coat the plates, and finally let them dry. That is all.

"My process is much more complex:—

"*Collodion—Silver Bath—Developer*.—Everything is combined together, and all should be carried on with the greatest precision to obtain the result which I infallibly arrive at. Even the preservative of Dr. Towler is not according to my formula, for we read in the *Camera Oscura*:—

"PRESERVATIVE SOLUTION.

Water	...	...	...	300 grammes
Ground coffee	...	...	...	30 "
Refined sugar	...	...	...	15 "

Put the ground coffee and sugar into a bottle, then pour in boiling water, and cork up. When cool, filter.

"Why did the Professor boil the coffee five minutes? And the developer? He uses—

Double sulphate of iron and ammonia	...	...	...	3 drachms
Water	...	...	...	4 ounces
Nitro-gelatine	...	...	...	40 minims
Alcohol	...	...	...	40 "

"I, on the contrary, have directed—

Distilled water	...	...	...	300 grammes
Double sulphate of iron and ammonia	...	...	...	7-50 "
Crystallized sugar	...	...	...	7-50 "
Sulphate of copper	...	...	...	7-50 "
Citric acid	...	...	...	15 "

"Is it not probable that all these changes enter for something in the final result? But even more than this, I recommend, as a condition, *sine qua non*, to dry the plates over the fire after having treated them with the preserving liquid. For this purpose I use a tin box filled with very hot sand or boiling water, kept at the highest possible temperature by means of a spirit-lamp; and after that I put them in a box with chloride of calcium on the bottom, so that the collodionized surface takes the appearance of a very brilliant varnish, contrary to the conclusion of the learned

Professor. The least trace of dampness, which at times is condensed on the plate in passing from one ambient to another, is an infallible cause of non-success; and it has sometimes happened that I could not produce the least shadow of an image, even after an exposure of ten minutes, whilst, with my ordinary method, plates prepared twenty-two months back gave me excellent negatives after ten seconds of exposure; and after twenty-four hours I guarantee the instantaneity, provided that there are no deviations made from my prescriptions.

"Besides, my process is much used in Italy and elsewhere, and every one is satisfied. It would not be so if, as Dr. Towler affirms, the sensitiveness of the plates lasted only one or two days. Many professional photographers make use of it for portraits; and the Signor Chevalier Marini, of Genoa, wrote to me a year ago: 'Since I tried your process I always prepare my plates at night, and the next day I make use of them for portraits, as the customers arrive. What an economy of time for me, and a saving of annoyance for them!'

"Now I have introduced radical modifications in my process; it is even more simple, more sure. On one hundred plates exposed, if the sitting is good, not one will fail. I have proposed to the French Photographic Society to send one dozen plates, so that they could be tried at different times. I will give them the time of sitting for each difference, and I am sure that the result that I have indicated beforehand will be reached. I have so much confidence in the coffee preserver, and I have always obtained such fine results, that I should like to see it tried by all landscape photographers; but exactly according to my formula, otherwise I can promise nothing, and new experiments would have to be made."

Mr. Jex Bardwell, in the same journal, states that his experiments with coffee plates has been much more satisfactory than that of Dr. Towler. Speaking of the first batch of plates he tried, he says:—

"I found them everything I could wish, they being much less trouble to prepare than by any dry process that I have found at all satisfactory; very clean, free from streaks or fog, full of detail, and very sensitive, and, I must say, a good keeping plate, for the last one I tried, being within a few days of four months old, gave me a good result with thirty seconds' exposure. The plate was every way good, clean, free from fog, and intensified as free as a new plate. The coffee plates are eminently free from that hardness so often seen in a dry plate. I have had considerable experience as a dry-plate worker, and have none to suit me so well. I even use dry plates for solar landscape negatives. I cannot say too much in favour of the coffee process, and can assure the dry-plate worker that it is one every way worthy of his confidence. I look on pyrogallic acid as the proper developer for a dry plate, and if the Professor will but try the coffee plates on their own merits, and not in testing an iron developer, he will come to different conclusions."

In our friend Dr. Towler's experiments, aiming at the uniform treatment in development, and estimating results under such treatment, is, perhaps, scarcely a fair mode of judging the value of a process, since almost every kind of dry plate requires its own special development to secure the best results.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXV.

"The exclusive power of chiaroscuro is to give substance to form, place to figure, and to create space. It may be considered as legitimate or spurious; it is legitimate when, as the immediate offspring of the subject, its disposition, extent, strength, and sweetness are subservient to form expression and invigorate or illustrate character, by heightening the primary actor or actors

and subordinating the secondary; it is spurious when, from an assistant aspiring to the rights of a principal, it becomes a substitute for indispensable or more essential demands."—*Fuseli*.

CHIAROSCURO.

The natural and simple effect of light, with its attendant shadow on objects, is given with greater truth by good photography than by any other method of delineation, although in ignorant hands it may degenerate into weakness, or, as is more often the case, take the form of patches of black and white unconnected by gradation. However, in these chapters I assume that the student is a good manipulator, and has a sufficient technical knowledge to render it unnecessary for me to say anything on that part of the subject; I shall therefore confine myself to a consideration of how best light and shade may be arranged so as to produce the most beautiful and striking pictorial effect. A knowledge of how to mass light and shade, with its intermediate gradations, connecting one with another, to which the name of chiaroscuro has been given, is most necessary for the student to attain, and can only be thoroughly learnt by careful observation of nature and the study of the works of those masters who have excelled in this important branch of the art; there are a few simple rules, however, a knowledge of which will assist the student in his further studies in this direction. It is to these rules that I now propose to call his attention.

Chiaroscuro not only lends a "something more exquisite still" to the most perfect outline, but clothes an inferior design with a beauty it would not otherwise possess. This is notably the case in the pictures of Rembrandt, often ill-drawn, always vulgar in choice of form, but of priceless value for their marvellous chiaroscuro, the alchemy of his art transforming dross into pure gold.

That which, as a mere sketch, was flat and monotonous, when clothed in cleverly managed light and shade stands forth as a reality. It gives depth and roundness and space; it also contributes infinitely to expression and sentiment; likeness even can be altered by the way in which this great power is managed. If it be remembered that by the minute modifications in the place, form, and depth of shadows, the whole of the infinite range of expression of the human face is determined, the importance of judicious lighting and skilful disposal of shadows will be pretty well appreciated. Many of my readers will remember the marvellous exhibition of Herr Schultz, at the Egyptian Hall, who exhibited every ethnological type on his own face, principally by the aid of lights and shadows skilfully cast from different directions. The magic of light and shade has become a proverb.

The word chiaroscuro, derived from the Italian, and literally meaning light-dark, by no means clearly conveys the idea of what it is intended to express. Usage has, however, reconciled us to the use of the term to express, not only the means of representing light and shadow, but the arrangement and distribution of lights and darks of every gradation in masses in a picture so as to produce pictorial effect—just as the word composition is used to express the arrangement of lines.

The objects of chiaroscuro are, first, to give a pleasing general effect to the whole picture, by dividing the space into masses of light and shade, giving breadth of effect, and preventing that confusion and perplexity incident to the eye being attracted by numerous parts of equal importance at the same time. Secondly, to place before the spectator at once the principal object represented, so that the eye may first see it, and be gradually and insensibly led to examine the whole picture; to keep parts in obscurity, and to relieve others according to their pictorial value. And, thirdly, to aid the sentiment and expression of the picture.

It will be seen that I have omitted relief as one of the objects of chiaroscuro. There is no doubt that a certain amount of relief is of advantage to a picture, but to strive too much for this quality would be sacrificing a much greater advantage—breadth—for the sake of an effect which could not, in a picture, be made to compete with the perfect manner in which it is given in a toy—the stereoscope. Relief is not the object of the picture. If it were, the artist

would have to first see the place where it was to be hung, that he may see the direction in which the light would fall upon it, and his chief consideration would be that the objects in the picture should be lighted by the window of the room, his chief aim to produce an illusion, perhaps the most vulgar thing in art. Twining, in his "Philosophy of Painting," says on this subject, "Although relief may be considered as an additional advantage, and deserves attention as long as other points are not sacrificed to it, the artist would decidedly take a false view of the calling of art who would set it up as a goal, directing towards it all his exertions; and, fortunately, to strive, as some have done, for this kind of eminence, generally involves the neglect of other attainments which ought to have stood foremost. We cannot expect to see those powers which, like projection and relief, may be termed practical, imitated in perfection, with those which, like expression and beauty, are fruits of the imagination and sentiment; our physical nature is opposed to it. But in the picture, *chiaroscuro*, or light and shade, has other purposes to fulfil than those which in nature serve to mark the rotundity and projection of form. A happy distribution of the lights and shades becomes of itself a source of pleasing effect and beauty; at times, by concentrating the effect, and consequently the impressions of the observer, towards a given point; at times by extending the interest, with the dispersing of the lights, over a wider scene. It is towards the attainment of effect that the varied resources of light and shade are thus chiefly directed. Without this enlivening principle the eye of the observer, satisfied with a first glance at a picture, would immediately seek for recreation and amusement elsewhere, so necessary it is that favour and attention should be won in the first place by the external appearance, in order that those more hidden perfections which are the result of profound thought and assiduous study may in turn receive their due consideration."

I may quote a much greater authority to the same effect. Sir Joshua Reynolds says:—"This favourite quality of giving objects relief, and which De Piles and all the critics have considered as a requisite of the greatest importance, was not one of those objects which much engaged the attention of Titian. Painters of inferior rank have far exceeded him in producing this effect. This was a great object of attention when art was in its infant state, as it is at present with the vulgar and ignorant, who feel the highest satisfaction in seeing a figure which, as they say, looks as if they could walk round it. But however low I may rate this pleasure of deception, I should not oppose it did it not oppose itself to a quality of a much higher kind, by counteracting entirely that fulness of manner which is so difficult to express in words, but which is found in perfection in the best works of Correggio, and, we may add, of Rembrandt."

It is admitted by all writers on the subject that mere natural light and shade, however separately and individually true, is not always legitimate *chiaroscuro* in art. In nature generally light is shed indiscriminately on all objects, subordinate objects may be brought prominently forward, and important features may be cast into the shade. It is not so with art. Art must select and arrange, or it is no longer art. But although separate truth may not be true art, true art requires that there should be no absence of truth; but the truth must be represented as a whole. Hence arises the indispensable necessity of judicious selection in the subject and treatment of a picture, so that art may be observed and truth preserved. In no part of art is judicious selection of more consequence than in the choice of light and shade, because light and shade so governs and contracts the effect of a picture that a subject may be either beautiful or the reverse, according to the way in which it is clothed in light and shade. Photograph a landscape with the sun shining at the back of the camera, and the effect will be flat, tame, and uninteresting; take the same view with the light coming at the side, and the difference will be evident; the magic of *chiaroscuro* will be at once felt. Barry, speaking of the scenes about Hyde Park, Richmond, Windsor, &c.,

says: "The difference between a meridian and evening light, the repose of extensive shadow, the half lights and catching splendours that those scenes sometimes exhibit, compared with their ordinary appearance, do abundantly show how much is gained by seizing upon those transitory moments of fascination when nature appears with such accumulated advantage. If this selection be so necessary respecting objects intrinsically beautiful, how much more studiously ought it to be endeavoured at when we are obliged to take up matters of less consequence. How many of the deservedly esteemed productions of the Flemish and Dutch schools would be thrown aside, as intolerable and disgusting, were it not for the beautiful effects of their judicious distribution of lights and shades. Art is selection; it is perfect when this selection is pursued throughout the whole, and it is even so valuable, when extended to a part only, as to become a passport for the rest."

It is interesting to note here, incidentally, that Barry does not say that art consists in the manner of holding a pencil, or laying on colour, or handling a modelling tool; he does not even say that it consists in the embodiment of the imagination by means of these implements, but he distinctly states what has been denied by some modern critics when dealing with photography, that *art is selection*, and is most perfect when the selection is the most judicious.

It is the same with portraiture as with landscape photography: beauty will depend in a great measure on treatment. Take a beautiful face, place it fronting the light, and photograph it; the result will be flat and even, in some cases ugly. The most amiable face may be made to look cross, and even savage, by excess of top light. It is strange that the effect of light on the face is not more studied on the stage, where facial expression is seriously interfered with by the unnatural effect of the light coming from below.

Light and shade are always at our command, in portraiture at least, and in some degree in landscape, to compensate for our inability to regulate the drawing to any great extent. I do not say we can, like the enamellers, make an ugly face "beautiful for ever," but we can make a beautiful picture out of ugly objects if we can throw over them the glamour and witchery of perfect *chiaroscuro*.

PHOTO-ZINCOGRAPHY IN PRACTICE.*

BY J. WATERHOUSE, R.A.

TRANSFERRING TO ZINC.

THE transfers are trimmed with a pair of scissors, and all parts not required to transfer are cut away or stopped out with a composition of flour paste coloured with vermilion. Any faulty parts or corrections may be put in with a fine pen and the ordinary autographic ink used by lithographers. Several sheets of waste paper (spoiled prints, &c.) should be damped, and kept on a table under a board; a few damp sheets of clean demy paper will also be required.

The transfer is then placed between the sheets of damp paper, and allowed to remain for a short time, during which the zinc plate is placed on the press, wiped with a dry muslin rag, taking care not to touch the grained surface with the fingers; lay on it two or three sheets of clean paper, and pass it through the press once or twice till the pressure is regulated. Examine the transfer, which should not be very damp (experience is the only guide); if damp enough, take it out, lay it down carefully in the place it should occupy on the plate, over it lay a sheet of clean damp paper, and over this a sheet or two of dry paper. If the transfer is new, once passing through the press is sufficient. The effect may be examined by gently lifting one corner; if all the ink has not left the paper, turn the plate and pass it through the press again, slightly increasing the pressure. The transfers will be found closely adherent to the plate. Damp the back of it with sponge and water, and after a few

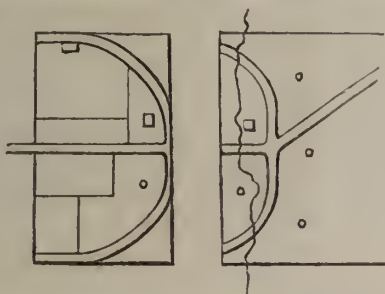
* Continued from p. 335.

minutes, or as soon as the white parts appear loosened, gently remove the paper. If the operations have been properly carried out, the ink should have been almost entirely removed from the paper. The plate is now washed with water and a soft sponge, to remove all traces of paper and gelatine, and is fanned dry with a fan made of a stiff piece of cardboard inserted in a wooden handle. Should any corrections be required, they may be made with pen and transfer ink or with an etching point, as will be afterwards explained under the head of "Corrections." It is sometimes advisable, especially if the work is delicate, to let the plate remain a little time before etching, and also to warm it slightly, which causes the plate to absorb the greasy ink more perfectly, and strengthen the fine lines. The plate is now ready for etching; but before describing that operation I will give an account of the plan to be pursued in joining together several transfers on the same plate. If the work has been copied in sections, and it is desired to join all the transfers together, attention to the following directions will secure good results:—

1. A liberal margin must be allowed all round the sections.

2. All the sections must be copied under precisely the same conditions, so as to correspond exactly in size. The least shifting of the camera or plan-board will be sufficient to throw them out.

3. The transfer must be of the same age, otherwise some may transfer and some may not. To join the transfers, have ready a drawing-board, and two or three sheets of clean



paper, some pins, and some thick gelatine solution. Cut the black edges off the transfers, lay them down face upwards on the paper in their proper position, and select the best lines for cutting them, which should run as far as possible in blank spaces, crossing the work as little as possible.

Only one transfer is cut as a rule, but parts of the other one may be made available if desired. Now, with a pin, fasten down any two corresponding points on both transfers, and do so in as many points as may be required. When the work has been all fitted together, take some of the gelatine on a fine brush, and put a little between the transfer here and there, but not close to the edge of the join, or there is a danger of its spreading over the lines and spoiling the transfer; when this is dry take out the pins, gently turn the sheet over, cut away the paper of the under transfer to within half an inch or so of the joins, and pass the gelatine under the joins, and let it dry. The sheet may now be removed to the damping-book and treated as before. If the joins are too apparent on the zinc plate, any blank spaces may be filled in with a pen and transfer ink, or scratched in with a point, and any thickening of the lines may be reduced with the point of an eraser.

The plate must now be etched in order to fix the design on it and render the surface of the plate more capable of retaining moisture; this is done with a mixture of weak acid, tannin, and gum water. The theory of its action is not thoroughly understood, but it is supposed that the acid dissolves the oxide from the surface of the plate, and, by slightly corroding it, forms innumerable little hollows which retain moisture; the acid also decomposes the alkali con-

tained in the ink, and renders it insoluble. It is supposed that the gum and tannin combine with the surface zinc, and form an insoluble layer which preserves the zinc from the immediate contact of the water, and renders it more susceptible of receiving, without alteration, water and gummy liquids. The etching, also, draws off all dust and greasy stains, and increases the sharpness and vigour of the lines. The etching liquid is prepared as follows:—1 quart decoction of galls; 3 quarts gum water, about as thick as cream; 3 ounces phosphoric acid. The decoction of galls is prepared by soaking 4 ounces of bruised Aleppo galls in 3 quarts of cold water for twenty-four hours; the water and galls are then boiled up together, and afterwards strained.

The phosphoric acid is prepared by placing sticks of phosphorus in a bottle of water, the ends of the phosphorus being uncovered. Air is admitted by making a hole through the cork. This causes the phosphorus to become oxidized, forming a mixture of phosphorus and phosphoric acids, which dissolve in the water as they are formed. The solution will be strong enough to use in a few days. Phosphoric acid can be purchased ready prepared at the druggists', and is, I think, preferable, phosphorus being a dangerous material in inexperienced hands.

Before the etching liquid is used, its strength should be tested in the following manner:—Apply a drop of the etching liquid to a piece of clean, polished zinc plate, and wipe it off after twenty or thirty seconds; the stain should be distinctly visible, though slight, and of a light grey colour. If the stain be deeper, add water; if lighter, strengthen with some phosphoric acid. Some other etching liquids have been recommended, but they contain sulphate of copper, and have the disadvantage of darkening the surface to such an extent that the detail is not sufficiently distinct. The etching liquid is brushed all over the plate with a broad brush, and allowed to remain a few seconds; the excess is then wiped off with a cloth, and the plate is fanned dry; as soon as it is dry, the preparation is thoroughly washed off with water. It may be allowed to remain without any harm if it is inconvenient to wash it off at once, as its action ceases as soon as it is dry. The strength of the etching liquid varies according to the nature of the subject; for fine work it should be used weak, but for vigorous subjects, or if the ink contains a great deal of soap, it may be used stronger. If the etching is not sufficient, the work is apt to run smutty; and if etched too strong, the delicate lines are destroyed.

The etching having been thoroughly washed off, the plate is sprinkled with turpentine and a few drops of water, and gently rubbed with a cloth till all the ink is taken off (for photo-carbon transfers in half tone a mixture of one-quarter glycerine and three-quarters turps is used instead of plain turpentine); it is then damped, and rolled in with the ordinary lithographic printing-ink, rather stiff. The ink is prepared by taking equal parts of middle and thin litho-varnish, and adding a little to a lump of best chalk litho ink, about the size of a hazel nut, or larger if required. This is well mixed with the palette knife, and then worked quite smooth with the roller. The ink should not be too thin, and must be harder for fine work. It is better to have stiff ink. A proof is pulled on thin paper, and any corrections found necessary may be made. Several prints must be pulled on the thin paper before the plate is in good working order; when that is the case the plate paper can be used and the required number of copies printed off. When copies of very fine work are required it is better to print on enamelled paper, which may be prepared as follows:—Quarter of a pound of Russian glue is soaked in 3 quarts of water till quite soft, and then dissolved with heat; 1½ pounds of zinc white are ground with water on a slab, and then mixed gradually with the solution of glue, and passed through a hair sieve. The paper is coated twice with this preparation; the streaks are obliterated by going lightly over the surface with a soft camel's-hair brush. This paper must

be used dry, and the plate must be thoroughly dried after rolling in with ink; if the plate or paper are at all damp there is a liability for the preparation to stick to the plate and damage the drawing.

When printing fine, close work, or in hot weather, it will be found very advantageous to use the following solution instead of water for damping the plate while printing; care must be taken, however, to keep it neutral, otherwise it will act as an etching solution, and the fine details will be gradually obliterated. Take 24 ounces of mucilage of gum arabic, add lime-water till it is neutral to test-paper, then add 2 ounces of glycerine, and mix well. To 2 ounces of the above liquid add 10 ounces of water, mix it well, and use this for damping the plates while printing. Only a small quantity of the first solution should be prepared, as it is liable to get sour; it should be tested before use, and if sour more lime-water must be added. By using this solution the finest work may be printed without clogging up. Further details on the subject of printing will be found in any treatise on lithography. Though very simple in theory it requires a great amount of practice and manual skill to become a good printer. When the plates are put away they must always be protected by a coat of gum, which should be laid on evenly, and quickly dried. If it is intended to keep the plates a long time before printing again they should be rolled up with the transfer ink already described, or with the following:—

Wax	...	...	...	100	parts
Asphaltum	...	...	...	100	"
Tallow	...	...	...	40	"
Lampblack	...	...	...	20	"

The above are divided into small pieces, and digested in turpentine, and stirred up occasionally. After some days they will form a viscous mixture, which should be kept for use in well covered pots.

(To be continued.)

ON THE PRINCIPLES OF LIGHTING AND OF CONSTRUCTING STUDIOS.

BY DR. H. VOGEL.*

Now, suppose two points, a and a' (fig. 6), situated at

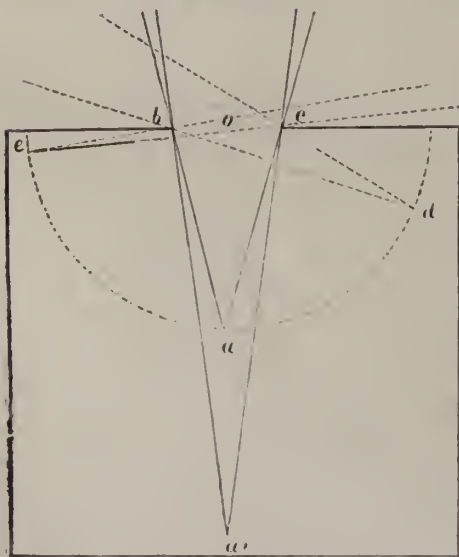


Fig. 6.

different distances from that narrow window. The farther we remove the object from the illuminating aperture the smaller is the angle of light. By the very simple mathe-

matical contemplation above mentioned, we find that the amounts of light of two points opposite to a window decrease in the same measure as the squares of their distances from the window increase.

If we place an object in a glass house twice as far from the window, it will be necessary to draw as much of the curtain as would make the area of the opening four times as great, if we wish to have the same intensity of light; or we might as well leave the opening in the curtains as it is, and increase the time of exposure four times. If the aperture of the window is great, the amount of light do not decrease with the same rapidity. At twice the first distance the strength would be a little greater than a quarter, and at three times that distance a little greater than one-ninth.

We may draw another practical conclusion from these considerations: an answer to a question which has often been asked of late; viz., What is most practical, a high studio or a low one? First of all we must answer a question. What purpose does a studio serve? A studio can be good for taking single portraits, but not for taking groups or reproductions, and *vice versa*. Such studios as, for instance, those of M. Reutlinger and M. Salomon at Paris, are excellent for taking single portraits, but whole groups can never be taken there. The cause is very easily to be recognized. When taking large pictures, drawings, &c., an equal illumination of the whole object is requested; with single portraits, however, the artist demands a rather unequal illumination. The head, being of first importance, must be lighter than the parts of less importance, for the facts to which only half-light is bestowed. These artistic properties are especially perceived in the portraits of Adam-Salomon, of Paris, and Carl Jagemann, of Vienna. If we should like to illuminate in the same way a whole group, all persons but one would only receive half-light, and scarcely become visible. Answering to the above question, I therefore must look to the intended purpose, and I first treat the most simple case, the construction of a studio for taking single portraits.

Suppose a skylight of about 25 feet height, and therein an object, as, for instance, a man, $a' k'$ (fig 7) of 5' high;

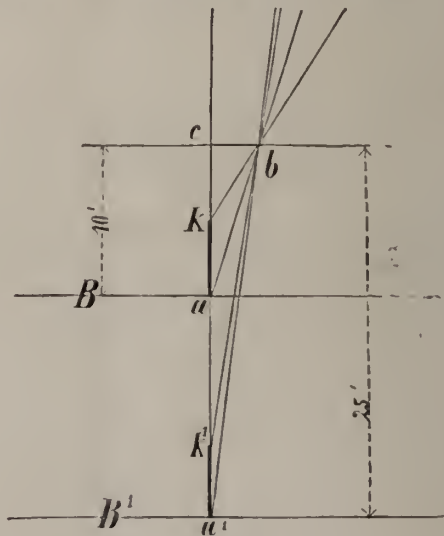


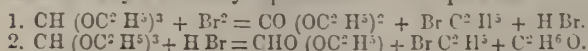
Fig. 7.

above this object we make a certain opening, $b c$, in the curtains, which is at a distance of 20' from the head and of 25' from the feet; therefore, the amounts of light will be as $400 : 625 = 16 : 25$, which is almost as 2 : 3. Now suppose a skylight of 10' high, all other circumstances being the same, the distance of the head from the aperture will be 5', that of the feet 10', and therefore the amounts of light will be as 1 : 4.

It is obvious how great the differences are. In the first

* Continued from p. 331.

ether. We have detected the presence of formic ether in the liquid, the boiling point of which ranges between 50° and 100° Cent.; by boiling with potash and distilling with sulphuric acid a strongly acid liquid was obtained, presenting all the characteristic properties of dilute formic acid, and capable of reducing nitrate of silver and mercurial salts. We believe, therefore, that the reaction of bromine upon the ether of Kay is correctly represented in the equations:—



These equations we have verified by taking account of the ether and bromine employed, and likewise the bromide of ethyle and carbonic ether obtained.

The first reaction consists, therefore, in the liberation of an ethyle and one of hydrogen of the tribasic formic acid by the bromine; the carbon of the radical of which one affinity has been liberated combines with an atomicity of an atom of oxygen liberated by the removal of the alcoholic radical. If the reaction is regarded in this light it is possible to realise the inverse reactions of the nascent hydrogen upon bodies containing carbon, connected by two affinities with one atom of oxygen.

Orthocarbonic acid is attacked by bromine in a cold state, giving rise to bromide of ethyle and carbonic ether; upon the latter, bromine reacts only when warm, disengaging carbonic acid and leaving bromide of ethyle. In both cases other bodies are likewise formed, but the nature of these we have not as yet studied.

Acetic ether, when cold, is not attacked by bromine, but on warming the mixture in sealed tubes products of substitution are formed, and bromide of ethyle. Oxalic and benzoic ethers are not acted upon by bromine, even when warm; while, on the contrary, ethylglycolic acid yields bromide of ethyle when heated with bromine.

We propose making a deeper study of the reactions herein mentioned, and will give shortly the results of our researches.

AN EASY MODE OF OBTAINING THE POSITION AND FOCUS FOR FIELD VIEWS.

BY W. CAMPBELL.*

MANY years ago, perhaps a dozen, I was very enthusiastic in my profession; indeed I am so still, though it may be there is not that ardor displayed now which characterised my pursuits then. I loved and longed to carry from the field the pretty scene I looked upon, and to obtain it I often showed an enthusiasm which, had it been exhibited in a less laudable undertaking, would, I am sure, have seemed very unbecoming. To ask a perfect stranger to allow me the use of his window, or to run into a man's garden, to obtain a better view without once saying, 'If you please, sir!' was among the least of my impertinences. When I look back upon them I fairly blush: but what will enthusiasm not do? It clouds the vision, dims the light of more refined sentiments, and, if not mean, is certainly selfish. I never dreamed of any wrong. However, I never met with a rebuff; on the contrary, I had many kind invitations, and I am now of opinion that the public are not only tolerant, but indulgent to the enthusiastic photographer.

In my pursuits I often found much time was lost in ascertaining just the right distance required to obtain the field on the ground glass, especially if a house was in the view as a principal object; and also time was lost in the focussing. Now, could I have a sure mode of placing the camera without the trouble of using a black cloth, and have it in focus ready to proceed, I fancied I should be a gainer. So I set to work and overcame the difficulty. I proceeded thus: I soon found that all objects in the field of view were in the right focus beyond a certain distance; there was therefore no further necessity for focussing on the field; all I had to do was to make a line, drawn on the base of the

camera, and consider this as the focal point for field view. The next thing was to get the area of the field of view. To do this, I took a cardboard, and bending it in the shape of a funnel, I looked through the large end, and contracting the smaller, so that it would circumscribe the same area as the lens would circumscribe on the ground glass, I fixed it there. This I kept as a guide, always in my pocket, so that when I wanted to know if a particular spot would be in the field of any view I wished to take, I had only to apply to my cardboard funnel for the information. Exercise, however, soon gave me experience, and I could tell with my bent hand, looking through the opening made by closing the fingers over the thumb, what to expect. I had still another trouble. The point selected as the centre of the view could not be placed on the centre of the ground glass without looking. It was either too high or too low, too much on the left or too much on the right; of course it involved the necessity of shifting the camera with black cloth over my head; this was troublesome, and had to be remedied. After some time I hit upon a plan. I remembered that in fixing a gun it must be so placed that the sight covers the object, so I followed up this idea. I drew a line on the top of the camera corresponding with an imaginary line drawn through the centre of the lens to the centre of the ground glass; and in front, on the top of the camera, I made a small hole, and on the back made another hole; on the line in each of these two holes I placed a peg of wood, and they sighted my object, and was pleased to find that I was right. The ground glass showed on the centre, the object I had sighted on the top of the camera.

The whole affair was now brought to a nicety. When I wished to get a view, I first applied my cardboard funnel; to get the area and distance, of course, if too large a field of view was seen, I had to go forward; if too small, I had to retire from the object. Having got the distance, I then set up the camera, and drew it out to the marked line for the focus; then, looking over it, I brought the two points of sight to cover the centre point, and then proceeded to take the picture. I never looked to see that I was right; I was sure I could not go wrong.

NEW RED COLOURING MATTER.

DR. ADRIANI describes, in the *Chemical News*, some experiments with rosolic acid, or aurine cake, in the production of various forms of a colouring matter yielding many brilliant tints of red. The tinctorial power is stated to be very great, and although the red rosolic acid has generally been regarded as fugitive, the new combinations seem to give promise of more permanency. Amongst other experiments, he says:—"I tried a solution of aurine in carbonate of ammonia, and precipitated it with chloride of barium; after repeating the process already described again, I obtained in this way a very brilliant flesh-coloured pigment. I mixed, in an earthenware glazed mortar, some aurine cake and strong baryta water, filtered this mixture, and added to the filtrate very weak sulphuric acid, just enough to neutralize the baryta; in this way I obtained a pigment which, after drying (of course some washing, but not to excess), can vie, in beauty and tone of colour, with genuine carmine. I next proceeded to precipitate an aqueous solution of sulphate of zinc with a very slight excess of a solution of aurine in dilute caustic potassa, washing again, slightly, the precipitate, and drying it at 212°; the pigment so obtained has a fine rose colour. On trying sulphate of zinc again, but with a solution of aurine in dilute carbonate of potassa, after drying, a very peculiar and somewhat dull pinkish-coloured pigment is obtained. A most magnificently bright scarlet, of deep hue, is obtained by first triturating together some previously separately-powdered aurine with lime-water (not milk of lime), filtering the turbid liquid, and next passing gently through it a current of carbonic acid gas. A precipitate ensues exhibiting the colour already referred to; on drying it, after having carefully collected it on a filter and slightly washed it, I find that even below 212° its colour is very much altered and impaired. I find, however, on instituting experiments on purpose, that if the pigments referred to are dried over sulphuric acid at the

* *Humphrey's Journal*

ordinary temperature, their primitive beauty, as seen on precipitation, and while yet moist, is to a very great extent preserved. As already stated, none of the pigments described are fit for oil colours: I have tried them, but none will do at all; but, undoubtedly, mixed with strong solutions of gum free from acidity, or good size, or, better yet, gelatine and albumen, these pigments might be of use in colouring paper-hangings, toys, and other ornaments. As regards the solutions of aurine in weak fixed alkalies and their carbonates, from experiments I instituted, I think I may recommend anrine cake as an article for the manufacture of a red writing fluid—red ink—of great beauty. Of the solutions I tried for this purpose, I find that the solution in carbonate of soda answers best: this red ink can, firstly, be used with steel pens, not only not corroding them, but actually on account of the alkali protecting the steel from rust and corrosion; and, secondly, this ink would not affect blue-laid paper coloured with ultramarine, which latter pigment is decomposed by acids; and, since ordinary red ink is usually very acid, both the pens and paper suffer, if ultramarine blue-laid paper is used for writing. Another advantage of the use of the solution alluded to, instead of red ink, is that it may be safely used by mechanical draughtsmen with their steel drawing-instruments, which will not suffer from its use. Tampering with what is written with the alkaline aurine solution with acids, for instance, will at once become evident by the writing becoming yellow, while the primitive colour cannot be restored.

"I find that anrine cake is to some extent soluble in an aqueous solution of bicarbonate of soda, yielding a solution of a brilliant scarlet-red hue; on writing with the said solution I found that, after drying, a very pale rose, or, when a more concentrated solution is used, an orange-coloured writing, ensues. I prepared all these solutions at the ordinary temperature, by first pulverising the aurine cake in a stoneware or glass mortar, and next adding the aqueous alkaline solution, and rubbing it and mixing together for a length of time, and next filtering through good ordinary white filtering paper. Notwithstanding it is asserted that the colour from rosolic acid is very fugitive, I find that things written now, five, and even eight weeks ago, exhibit no signs of change or fading. Aurine in alkaline solution far surpasses best red ink in brilliancy; if its asserted instability should, on a more severe and lengthy trial, prove incorrect, alkaline aurine solutions may be of use also, instead of water-colours for drawings, for mechanical and other draughtsmen."

Scientific Gleanings.

NEW USE FOR COLLODION.—Dr. Voillemier recommends a method of his own for cauterization in surgery. He applies one or two coatings of collodion to the skin, letting them dry before he applies the canter, in order to avoid setting fire to the ether evaporating from the film. The red-hot iron instantly destroys the collodion at the point where it touches, but the heat radiating from the knob exercises no action on the film, which, being composed of pure cellulose, is a very bad conductor of caloric. If, after the operation, the collodion be removed, the skin under it will be found unscathed; but it is best to leave the coating on till the canterized point is healed.

ALBUMEN.—Large quantities of albumen, or the white of eggs, and also of yolk, are imported in Southampton from Normandy. The albumen is used by photographers and calico dressers, and the yolk is used in the manufacture of gloves. The price of prepared white of eggs was two guineas per pound not long since. This arose from the waste it suffered during the process of preparation. This waste amounted to as much as 85 per cent.

NEW MOTIVE POWER.—Some of the Italian journals state that Father Secchi, whose name is well known in connection with astronomical photography, has discovered a motive power lighter, stronger, and more economical than steam. They add, that the learned Italian is stated to have laid his invention before the court of Portugal, which is disposed to purchase it.

GLASS CUTTING.—A mode of cutting, or rather dividing, glass, which is a slight modification of an old and well-known method, has been recently invented in France, and is practised in the large establishment of the Glass Company of Baccarat. A jet of highly heated air is directed from a tube on the vase or other object to be cut, which, while made to revolve on its

axis, is brought close to the nozzle of the tube. The object being then cooled suddenly, the glass divides at the place operated on with extreme accuracy.

IODIDE OF STARCH.—M. Guichard has recently examined this substance carefully, and has arrived at the conclusion that the colourless iodide of starch has no existence; the so-called iodide of starch is simply starch tinted by iodine. Heat separates the iodine from the starch; the iodine remains in the water, either as such or as hydriodic acid.

ARTIFICIAL METHYLIC ALCOHOL.—E. Linnemann.—Methylamine was prepared from cyanhydric acid, with slight modifications, according to Mendius's method, and converted into methylic alcohol by means of argentic nitrite in the manner described on a former occasion (*vide Chemical News*, No. 436, page 181). The corrected boiling point of the pure alcohol at the normal barometrical pressure (670 m.) is 67.1° C., sp. gr. at + 21° = .8574. The iodide of the alcohol has the sp. gr. at 25° = 2.269, and boils under a pressure .738 m. at 42.5°. These observations prove the identity of the alcohol obtained from cyanhydric acid with the methylic alcohol from wood spirit. (*Ann. Chem. Pharm.*, cxlv., 42).

CONVERSION OF METHYLIC INTO ETHYLIC ALCOHOL.—A Siersch.—Acetonitrile, prepared by acting upon potassic methylsulphate with potassic cyanide, was converted into ethylamine, and from the nitrite of that base alcohol was obtained. This alcohol was found to be a mixture of ethylic and methylic alcohol, in the approximate proportion of 4 to 1. The author explains the presence of the latter by the assumption that during the decomposition of the nitrite of ethylamine alcohol has been regenerated. (*Ann. Chem. Pharm.*, cxlv., 46).

ELECTRICAL DEPOSITS ON PAPER AND TISSUES.—The *Scientific American* gives an easy method for depositing copper, silver, or gold, by means of the electric battery, on paper and other fibrous material. The process consists in making the paper a good conductor of electricity by coating it with a material which will not peel off. One of the best methods is to take a solution of nitrate of silver, and pour in liquid ammonia until the precipitate poured is entirely redissolved by stirring. The paper, silk, or muslin is soaked in this solution for one or two hours. It is then taken out and dried, and exposed to a current of hydrogen gas, by which metallic silver is reduced; and the tissue becomes a good conductor of electricity, so that it may be electro-plated with copper, silver, or gold in the usual manner.

Correspondence.

INFORMERS AND PIRACY.—GRAVES v. MERCER.

SIR,—As considerable interest has been displayed in your journal with reference to the raid on photographic "pirates," and remarks made from time to time on the disreputable means often resorted to by eminent print publishers to protect their rights, I beg to enclose you a brief report from the *Irish Times* and *Dublin Mail* of the case of Graves v. Mercer, which, having been dragged through the different law courts during past eighteen months, at length came to an issue, and was tried here on Friday and Saturday last; and with your kind permission I will offer a few observations on points that are passed over in silence in all the newspaper reports.

This action was one of sixteen, all of which were brought separately, and eleven of them by Mr. Graves. Had he succeeded, no doubt we should have heard a great deal about the grave nature of the offences and the necessity for securing exemplary damages; but now the issue is the other way, plaintiff can appreciate with the keenest enjoyment, I hope, the sensations he so kindly intended should be the exclusive privilege of defendant.

Now, I meant to have stated at the outset that I do not dispute Mr. Graves's right to the property he has so liberally paid for, and never did; quite the other way; and the best evidence of which is the fact that I have quite discontinued the production and sale of all copies of engravings, and this notwithstanding the circumstance that there are thousands of engravings accessible, to which no copyright restrictions whatever apply. I made this resolution rather than be in constant col-

* A report of the case was already in type when those sent by our correspondent reached us. See last issue.—ED.

lision with the print publishers, who, by the way, frequently commence proceedings utterly regardless of the law, which gives them protection *only* in those cases where they comply with its requisitions.

The first remark I wish to make on the case is this, that out of the hundreds of photographs bought of me by King, alias Hyams, alias Hymams (of "gentlemanly appearance," as one reporter writes, who must mix in strange society if he insists on the correctness of his standard of gentility), not one solitary photograph was produced, though, strange to say, several twice as large as mine were exhibited to the Court, and were stated distinctly *not* to have been obtained from me, but which, nevertheless, were handed about and alluded to from time to time in such a manner as must have almost induced some of the jury to imagine they were mine, or, to say the least, had something to do with the case. And how far this succeeds may be inferred from the fact that in one of the newspaper reports they were actually stated to have been bought of me! Now where did these photographs come from? They were dug out of the fire which destroyed Her Majesty's Theatre and Mr. Graves's shop, says plaintiff. But how, I ask, did it happen that these particular photographs escaped the fire, while *all* mine were consumed, and this although Mr. Graves positively declared all these illegal photographs were kept in *one* receptacle at the end of his shop, and which he facetiously termed the "Pirate's locker"?

Secondly, observe the great care used by Messrs. Graves that no confusion shall arise as to the particular spoil obtained from different "pirates." See what extraordinary precautions they adopt to prevent the possibility of confounding the innocent with the guilty. You will please notice Messrs. Graves's *modus operandi* recognizes in the fullest manner the justness of that saying so familiar to lawyers; viz., that it is "better ninety-nine guilty men should escape than one who is innocent should suffer." And how do they accomplish this desirable object in my case? As follows:—These illegal photographs, said to have been got from me, are carried about by King during the devious voyage which brought him to Manchester, Birmingham, Leeds, &c., and which occupied over *two months*, and all the time he is visiting the various depots for sale of these things, and buying goods by fifties and hundreds, relieving the monotony of his delightful calling by getting drunk once or twice a week (I have his own word for the truth of this, and that he never told a lie in his life). In due course, this agent of the eminent publishers arrives in London, and hands over the contraband to the admiral, and all the pictures are put away in the *same* desk for the present. But when the process of classification commences, we can easily imagine the method pursued to distinguish photographs got from "men of straw" from photographs got from people able to pay substantial damages.

Thirdly, it seems to me there is no difference in principle between a spy of King's type and the irrepressible Fenian informer, and that, as the uncorroborated evidence of the latter would not be listened to for a moment, so in these cases no jury could be asked to convict in the absence of *eye-witness* testimony. But what really happens in my case? King called *alone*, and was never accompanied by his accomplice upon one of the eight or ten occasions I saw him; and even King himself stated that Cattermole, his confederate, was with him on *one* occasion only, and then did not enter my house. Cattermole's evidence amounted to this: that having searched King and watched him into my house from a *distance*, so as to avoid observation, he awaits his return, and King then shows him a parcel of photographs he had bought, including those which were the subject of this action. Now, whatever could have possessed Mr. Graves to imagine for a moment that a jury would convict any respectable man upon such a tinkering tale as this, when, to say nothing of the extreme improbability of Cattermole refuting himself, King had only to employ a third confederate (whose existence need not be alluded to) to accomplish the whole transaction, and cheat his own friend into the bargain?

But I must not further trespass on your space, and will only add that the judge who tried the case most emphatically denounced the stratagem used by plaintiff, describing it as a "system that no just mind could approve;" and the jury sufficiently testified their sense of the unmistakable difference between a "a tissue of lies"—to use the judge's own words—and the truth, by handing down, in less than twelve minutes, their verdict for—Yours obediently,

THE DEFENDANT.

MR. BOVEY'S MODE OF TONING.

DEAR SIR,—It is with pleasure I have read Mr. Bovey's description of toning, and I must, before proceeding, individually thank him for the many proofs he has given of his love for our beautiful art by making known to his brother photographers his practical experience in many of its details, and particularly for his inviting discussion on his last process of toning. Taking advantage of that invitation, I will ask him a few questions. Of course photographers require a process by which they can always depend upon producing the *tone* they wish; therefore it is necessary to have one in which the component parts of the toning bath will not be changed (with the exception of the loss of gold); and this brings me to the first question. Mr. Bovey says he prefers his prints *not* to be washed from all free nitrate of silver. If that is the case, how can he depend upon the exact amount of silver that remains in the print? Because, if more remains in one than in the other, there will be, of course, a difference of tone in the finished print; and will not every one he tones in that state alter his bath by the formation of "*nitrate of soda*"? I would ask, also, what effect the salt so formed has upon the action of his bath? And does not the formation of chloride of silver over the surface of the print prevent the gold from being deposited on those parts of the picture on which it is required? for my experience has taught me that where *any* deposit of chloride of silver on the surface takes place, I never get the clearness and depth required. This, of course, has been with the acetate and sulphocyanide baths, as I described to you a little time since, and which answer admirably. I can depend upon every lot of prints coming out the same. I know I use a great deal of gold, but I also know that the gold used is on my pictures, and therefore the *more* there is on them the *more permanent* the prints must be.—I am, dear sir, yours truly,

G. H. BRITTON.

10, High Street, Forest Hill, July 8th, 1863.

LANDSCAPE BACKGROUNDS TO PORTRAITS.

DEAR SIR,—It has occurred to me that a much more simple and convenient method of taking figures and groups with natural backgrounds than that proposed by Mr. Burgess in your last number, or by any of the usual plans of double printing, would be to take the landscape on a carte-sized plate, and enlarge it on canvas or paper to 7 by 6 feet. This, I imagine, may be done without difficulty, as it would not require to be sharp; indeed, sharpness would be a defect. This background might be used for various groups, whereas by any other method a fresh one would be required for each.

The foreground is very easily arranged from weeds, stones, or other natural objects, in the studio.—I am, dear sir, yours very truly,

BAYNHAM JONES.

Cheltenham, 14th July, 1863.

Talk in the Studio.

PERMANGANATE INTENSIFIER.—At a recent meeting of the Philadelphia Photographic Society Mr. Fassitt made a communication respecting the use of our permanganate intensifier. He found great advantage in the use of the chemically pure instead of the commercial article. The solution he used was 3 or 4 grains to the ounce of water, and was of a fine dark rose colour. To prevent the loss of intensity consequent upon varnishing the negative, Mr. Fassitt recommended flowing the plate with gum water. The greatest care was, he thought, necessary in washing the negative after intensifying.

IMPROVED DIPPERS.—A photographer miles from home has sometimes been placed *hors de combat* by discovering that his dipper had been left at home, or by breaking a glass one. We have heard of a forked twig being made to do successful duty in such a case. Our Philadelphia contemporary says that Mr. Garrett uses dippers made out of hickory wood, and finds them unequalled.

THE WEATHER AND PHOTOGRAPHY.—We have heard various complaints of photographic difficulties arising from the extremely hot weather, and also of its depressing influence on professional photography. The American photographers are complaining from precisely the opposite cause. We find it

stated in our Philadelphia contemporary that "twenty-six days in May it rained, consequently the photographers were in bad humour and growled, while umbrella and water-proof clothing makers were happy and smiled. The same condition of things yet exists (June 12) without any promise of a change; how much longer to continue none here can say; even 'the oldest inhabitant' gives up in despair, declaring that such he never knew before. Various causes are wisely suggested by all. Some say the Gulf Stream has changed its course; others, that they don't know."

PHOTOGRAPH OF THEODORE'S SON.—Few persons who have read the History of Rasselas have ever dreamed of the possibility of seeing a photograph from life of the Prince of Abyssinia. We have received from the Stereoscopic Company an excellent card portrait, which they have just published, of an Abyssinian prince; not Dr. Johnson's hero, however, but the intelligent little fellow who has recently arrived in this country, the son of Theodore. The child has a pleasing face, somewhat of the Egyptian type, and the photograph is capital.

A MONSTER PHOTOGRAPHIC GROUP.—Messrs. Mason and Co., of Bond Street, have recently invited our attention to perhaps the largest photographic group ever produced. It consists of a photograph nearly 12 feet by 7 feet in size, containing the portraits of 76 bishops, upwards of 60 of whom gave especial sittings for the efficient production of the picture. The scene represented is the Pan Anglican Synod, when the bishops of the Anglican Church throughout the world attended the conference at Lambeth Palace. The figures are arranged in front of the building in such natural grouping as could be effected in a few minutes. A good 10 by 8 negative was then secured, from which this enlargement was produced, and then coloured in oil. The difficulty of grouping such a number of male figures, of doing justice to portraits throughout, and of getting relief and variety with such a mass of black coats, may be well conceived; but the difficulty has been very fairly combated, and the portraits are in most cases capital. Such a work has national and historic value, and the picture ought to find a destination where its historic character will be fittingly recognized.

CURIOUS EFFECT OF GELATINE UPON GLASS.—A correspondent sends us the following account of a curious result:—

Having for experimental purposes poured a thick solution of gelatine upon a number of glass plates, three of them were set aside upon a shelf for some months; and one day, upon looking at them, I found that in all three cases the gelatine had separated from the glass, bringing away the whole surface of the glass plates in shivers, which firmly adhered to the gelatine. The surface of the glass was left full of ruts, like water-worn stone. I suppose it to be caused by the strong contraction of the gelatine and its firm hold upon the glass."

PHOTOGRAPHY AT WIMBLEDON.—Photography has become one of the regular institutions at the camp at Wimbledon. This year Mr. Blanchard goes to secure rapid or instantaneous groups and other effects. Messrs. Moira and Haigh, Messrs. Denezy and Hemery, are taking portraits there.

IRON INTENSIFIER FOR DRY PLATES.—At a photographic meeting of the American Institute Mr. Newton recommended alkaline development for tannin plates, followed, as soon as detail appears, by a solution containing sulphate of iron 1 drachm, citric acid 15 grains, water 2 ounces, and a few drops of a 15-grain silver solution. Any amount of intensity can be gained, and pinholes are avoided.

INSTANTANEOUS PICTURES.—At the same meeting Mr. Chapman exhibited some most excellent instantaneous stereographs, and suggested the following method of development:—Commence operations with the ordinary iron developer, with which push as far as possible; next wash the plate thoroughly, and treat with a solution of carbonate of ammonia 10 grains to the ounce of water, into which put a few drops of the ordinary pyro, silver, and citric acid solution, and a couple of drops of a 5-grain solution of bromide of potassium in water; after this has developed still further, and done its part, again wash, and redevelop as usual with pyro and silver.

TRYING FOR CHEMICAL FOCUS.—A photographer recently sent to a dealer for a lens to try. Not being known to the dealer, the latter proposed to send the lens to the rooms of a photographer in the same village whom he knew, where the other was asked to go and try it. This was objected to, for the reason that "he wanted to try the lens with his own chemicals, to see if there was any chemical focus in it." This reminds us of a

photographer who remarked once that he never made a larger picture than 8 by 10 with his instrument. It would cut 11 by 14, but he feared to attempt it. It strained his lens too much, and he feared he would break it!—*Philadelphia Photographer*.

STAINS ON NEGATIVES.—We are indebted to Mr. Garrett for the following plan for protecting the plate-holder from the action of the silver solution:—Sand-paper all stains and varnishes off, and apply a coating of lard all over the holder. It will then effectually resist the action of the silver solution.—*Ibid*.

RUINOUS COMPETITION.—A contemporary says that two photographers in Maine are endeavouring to ruin themselves by running down prices. They have whole-size down to twenty-five cents, and "album size" nine for twenty-five cents. A cent is equivalent to a halfpenny.

STAINS ON TANNIN PLATES.—Our Philadelphia contemporary says:—"Tannin may be entirely freed from all colouring matter by dissolving 6 parts of common tannin in 12 parts of warm distilled water, and adding 1 part of ether to it. Put the mixture into a bottle, shake it several times, and then set it aside for some hours, after which it is ready for filtering. The filtrate is quite colourless, and has no smell whatever. By using it the black stains, so common with tannin plates, may be avoided, for these stains have their source in the colouring matter of the tannin."

THE BROMIDE PATENT.—The decision in regard to the application for an extension of the Bromide Patent in the United States will be given this month. Mr. E. L. Wilson, the esteemed editor of the *Philadelphia Photographer*, is working strenuously, on behalf of the profession, to defeat the application. In reference to Cutting's original claim he says:—"We have proven that Mr. Cutting got his first idea of using it from another, who showed it to him in a printed book. We have proven that its use was well known in Europe before Mr. Cutting thought of it, or gave any evidence that he thought of it. We have the whole history of his pretended invention (?). The patent has been a swindle and an outrage upon the public ever since its birth." It is inexplicable to English photographers how such a patent was ever granted, or for a moment sustained. In view of the possible extension of the patent, photographers are active in experimenting with anti-bromide collodions, and excellent results are said to have been obtained.

INDECENT PHOTOGRAPHS.—William Dugdale and James Milson, who pleaded guilty at the last Middlesex Sessions to a breach of Lord Campbell's Act, were brought up to receive judgment. The elder prisoner, it appeared, had since the last session given most important information, which enabled the police to find out the persons by whom the traffic in indecent books and pictures has been carried on. Superintendent Durkin found no fewer than 35,000 publications, and about 500 pictures and photographs which came within the scope of Lord Campbell's Act. The owner of the house in which these nefarious works were discovered said he knew nothing about them. The prisoner Dugdale is 73 years of age, and Milson was his servant. The Assistant Judge, in pronouncing sentence, expressed his opinion that the age of Dugdale was rather an aggravation of than an excuse for his offence, and accordingly committed him for eighteen months. Milson was sent to prison for nine months.

PHOTOGRAPHY IN EVIDENCE.—The *Athenaeum* says:—"A new class of evidence has at length, like the electric telegraph, made its way slowly into the Admiralty Court. In a case of damage to a ship, photographs were admitted to show her condition—a development little expected thirty years ago in throwing light on law proceedings. The lawyers, however, are not to be put down by the alleged accuracy of the photographs, for on the ground of conflict of evidence they obtained a reference to the Trinity Masters. Still, some day, we may see a sworn photographer in Chancery and a new class of legal functionaries. Taking photographs may constitute part of the examination on the law of evidence."

To Correspondents.

CHLOE asks how she can remove photographic stains from a slab of marble which has been used to develop over, cyanide of potassium having been tried without success. We fear that the case is a difficult one, especially if the discolouration amounts to more than

a surface stain, as from the absorbent nature of marble it probably will. The stains probably consist of partly and completely reduced carbonate of silver and of carbonate of iron. Oxalic acid in strong solution would best remove the latter, and cyanide of potassium to which a little iodine has been added would best remove the silver stains; or iodide of potassium might be applied, and followed by cyanide. But in each case a little soaking and scrubbing with a brush will be necessary to do any good at all, followed by well washing in warm water. Possibly rubbing down and re-polishing will, after all, be the only effectual remedy.

WM. STURGEON.—Both the salts of which you forward us examples are really the same thing—iodide of cadmium. That labelled bromide of calcium is not a bromide at all. You may ascertain the distinction between a bromide and an iodide by a variety of tests, some of which are simple and easy. The addition of nitrate of silver will convert an iodide into iodide of silver which is yellow, whilst the bromide of silver is white, or of a cream tint. The addition of bichloride of mercury will convert the iodide into orange-coloured iodide of mercury, whilst the combination with the bromide is not so readily formed, and shows no red tint. An iodide strikes a deep blue tint with starch, but no such reaction takes place with a bromide. All the iodide reactions followed treatment of the salt labelled bromide of calcium.

C. W.—We have never tried the process in question, and cannot say much about it. It is probable that with a bromide only you would not get a very vigorous print. A mixture of bromides and chlorides gives, in our estimation, the best results for printing by development. A solution containing $7\frac{1}{2}$ grains of bromide of potassium and $4\frac{1}{2}$ grains of chloride of ammonium per ounce, with a 50-grain nitrate bath, will yield very good results. We have seen good results obtained with a solution containing 6 grains of iodide, 4 grains of bromide, and 2 grains of chloride per ounce. Alkaline development of paper prints would probably produce discolouration of the whites. Hot gallic acid may be used, and the exposure may, in such case, be shortened.

YOUNG.—The fact that you fail to succeed with several processes with which others succeed suggests that there is some want of care or precision in your working. The object of filtering the syrup through charcoal is to remove certain impurities. The solution should not be returned to the stock bottle after being used. The want of sensitiveness and the fog must have been due to error in some part of the operations, or impurity in something used, but we cannot tell in what the error lies. The commercial collodion of which you speak has the reputation of being very good. The fact that you could not obtain an image with it in either the wet or dry process suggests that you probably used it without being iodized. The photographic soap of which you speak we have not tried, but have heard good accounts of it. The nitrate bath being "blackened by a collodion plate" we do not understand. How was it blackened? Possibly the collodion plate had been contaminated with hypo or some other impurity, which decomposed the bath. Without knowing more details we cannot give you a remedy.

A. W.—We cannot tell you when bromide of potassium was first introduced into the market. Bromine was not discovered until 1826. It was first used in photography in 1840, and there is some dispute as to whom the honour of its introduction belongs; in this country we generally accord it to the late Mr. Goddard. Our American cousins dispute this. M. Biard introduced it into the paper process, we believe, the same year. Bromide of potassium was one of the earliest bromide salts introduced into commerce, but we do not know the date.

W. J. A. G.—It is difficult to trace the cause of your failure with morphine plates. It may be due to two or three causes. Many of the ordinary samples of commercial bromo-iodized collodion do not contain sufficient bromide, and the addition of about 1 grain per ounce is necessary to secure good results with most dry-plate processes. The soft water may have been impure: it sometimes contains traces of sulphuric acid and other impurities collected from the atmosphere of towns. The morphine solution may have been exhausted by using over and over a few times. 2. The matt silver stain like a slug-track, extending from the edge of the plate, is generally the result of contamination of the nitrate solution on the plate, from contact with the inner frame. Constant washing of the inner frame and allowing the plate to rest on clean blotting-paper will assist you. See article in the present number; see, also, a paragraph on the use of lard on the inner frame to prevent contact with the silver solution.

T. W. (Thornton).—The yellow stains are spots of imperfect fixation, most probably caused by the formation of small air-bubbles on the prints on immersing them in the fixing bath, the hypo being so prevented from acting perfectly where each bubble is formed. The result of imperfect fixation is the formation of insoluble hyposulphate of silver at each point, which decomposes and causes a yellow stain when the print is removed from the washing water and brought into full daylight; sometimes it becomes decomposed, and causes the stain on applying warm water. The remedy is to examine each print carefully after im-

mersing in the fixing bath, and remove any air-bubbles which are formed. Some samples of paper are more prone to such bubbles than others.

J. S.—You will find an article on enlarging by the magnesium light in our pages a few months ago, in which a good formula is given for the preparation of the paper. See answer above to C. W. As a rule, developed prints do not require toning, the developed image generally acquiring a deep brown or black colour. A fully exposed and rapidly developed print is generally warm in tone; one requiring long development generally passes to a black tone. The best developer is a saturated solution of gallic acid. You will find many articles on the subject on referring to the indexes of back volumes. Articles on pages 247 and 253 of our fifth volume will give you useful information.

B. L.—First apply a solution of iodine to the stain (made by dissolving 1 grain of iodine and 2 grains of iodide of potassium in an ounce of water), then apply the cyanide solution, which will remove the stain; finally, wash well.

Z. H. A.—The scrap of untuned and unfixed print was too much discoloured when it reached our hands to enable us to form much opinion of the marking; but we should judge from its appearance that it was from a defect in the negative. If it is not, we should require a larger example, or two or three of them, to enable us to form an opinion.

NO CHEMIST.—When the albumen is diluted in Mr. England's process the ammonia is still added: about 8 or 10 drops of liquid ammonia to an ounce of albumen solution. 2. The excited plate is washed, then coated with albumen solution, then washed, and then the silver solution is applied. 3. The collodion you mention will answer; but it will be better if you add to each ounce an additional grain of bromide of cadmium. 4. The edges of the plates may be varnished with the varnish you name. 5. Your 30-grain bath strengthened will serve. If it possess great excess of nitric acid, add a little oxide of silver to neutralize a portion of it. 6. Better make a new toning bath. We are glad to learn that our advice helped you so satisfactorily.

THOMAS STOTHARD.—The addition of a little more soluble cotton will probably assist you in obtaining vigorous images more effectually than will the addition of an iodide; or you may try the gelatino-iron developer.

W. H. W.—Thanks for your letter. We are quite of one mind on the subject named. We will speak to the Publisher as to the neglect in question.

THOMAS COLLINS.—We do not know of any stereoscopic slides of the statuary in the Vatican; but, if they are to be had, Messrs. Marion and Co., of Soho Square, will most likely be able to supply you. Specimens of the work of the lens you mention can doubtless be obtained of the manufacturer.

W. H.—Vignetting opal-glass pictures produced in the camera is effected by placing a piece of card with an oval aperture between the lens and sensitive plate, or by placing a vignette glass in contact with the negative. 2. Patent plate flashed opal answers best.

T. MARTIN.—Received. Thanks.

J. STUART.—We have very carefully examined the spots on the prints, which are singular and puzzling. We find that they are of three sorts: bright yellow spots, grey and transparent, and black and opaque. We are disposed to believe that the cause is in the mounting board; the origin of the latter class certainly is. On soaking and removing the print we find the spots chiefly on the board, and not on the print. They suggest the idea of a fungus growth, the consequence of the boards having remained some time damp. The boards contain a great deal of starch, and more hypo than is desirable.

ENAMEL.—On careful examination and testing of the cards sent we find a trace of hypo, but much less than in most commercial samples of cards we meet with. The amount is insufficient to cause serious injury.

Several articles in type are again compelled to stand over.

Several Correspondents in our next.

Photographs Registered.

Mr. A. PAUL, Putney,
Photograph of Regatta Prize Cups.

Mr. J. STARK, Stoke-on-Trent,
Photograph of Bust of Alfred Tennyson.

Mr. F. DOWNER, Watford,
Photograph of St. Alban's Abbey.

Messrs. W. and D. DOWNEY, Newcastle,
Photograph of Sir R. Napier.

Mr. W. TONKS, Birmingham,
Seventeen Photographs—Composition Pictures.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Toning Collodion Prints.....	349
Photography and the Abyssinian Expedition.....	350
Photography in Germany. By Dr. H. Vogel.....	351
Washing Machines. the Eccentricities of a Syphon. By Nelson K. Cherrill.....	352
Pictorial Effect in Photography. By H. P. Robinson.....	353
Photo-zincography in Practice. By J. Waterhouse, R.A.....	354

	PAGE
The Wet Collodion Process. By C. Sternberg.....	356
Causes of Fogging. By Jabez Hughes.....	357
Correspondence—Informers and Piracy—Graves v. Mercur.....	358
Talk in the Studio.....	359
To Correspondents.....	360
Registration of Photographs.....	360

TONING COLLODION PRINTS.

THE prevailing defect of the various examples of developed prints on a collodion film which come under our attention is a want of warmth and depth in the tones. Brown tints are rarely obtained, and, when secured, they generally lack richness and intensity. The prevailing tint is a greyish or bluish black, cold, and wanting in depth and force. We have more than once recently described the various modes of toning collodion prints, and the peculiar tints produced by different treatment, and it is unnecessary, therefore, again to discuss here the details of each method. We have, however, a hint to offer in reference to one of the methods, the conditions of success in which are not generally well understood.

Perhaps no tone more perfectly suits the peculiar character of the developed collodion print, whether it be used for enlargements or small pictures, than a rich black, either quite neutral or inclining to warmth. The tone obtained by treating the image first with bichloride of mercury and then with hyposulphite of soda is black, but it is generally a cold or greyish black, not perfectly satisfactory. The tone obtained by the use of a gold salt is generally black, but it too frequently inclines to a blue black, which is not more satisfactory than the grey black of the mercury salt.

We have recently been favoured by Mr. Burgess, of Norwich, with a sight of some examples of his Eburneum process, in which the picture is produced, as our readers know, by collodion printing in the camera. The tone in these specimens was of a singularly fine black, without a trace of blue, resembling the colour of a good engraving. In answer to our enquiries as to the mode of producing this tone, we learnt that gold was the colouring agent, but that success in securing the right tint was dependent upon some other conditions worth noting.

To produce the finest tone in Eburneum prints, and, of course, in all developed prints on collodion, a good negative, good light, a suitable developer, and gold solution of suitable strength are necessary, and it is difficult to produce a good black tone if any one of these elements of success is wanting. The negative need not be very dense, but it must have well-marked gradations, and *must not be fogged*; it must be clean and bright in the shadows. It is assumed, of course, that the collodion and nitrate bath are in good condition, and we need not here dwell on these. The quality of the light is too little considered in the production of collodion prints. It is assumed that a dull light, in which other work would be impossible, may be used for collodion printing, a little longer exposure being

quite sufficient to compensate for a little worse light. Mr. Burgess, whose opinion is valuable, not simply because his experience in this direction has been large, but also because his taste is cultivated and fastidious, states that he finds it impossible to get fine collodion prints, which will receive a rich tone, in a bad light. In this, as in many other photographic processes, protracted exposure does not quite compensate for lack of intensity in the light.

After careful testing and comparison of the iron and pyro developers, Mr. Burgess has given the preference to the latter for producing these prints. The formula which gives best results is as follows:—

Pyrogallie acid	...	...	...	3 grains
Citric acid	...	...	...	3 "
Water	...	...	...	1 ounce
Alcohol	...	...	...	quantum suff.

The exposure should be sufficiently full to enable the image to flash out on the application of this developer without much forcing. Experience alone can guide the operator to what extent the process of development should be carried to secure a tolerably dense reduction in the blacks of the image without getting any trace of reduction on the points of high light. Mr. Burgess fixes with cyanide, and, after washing well, proceeds to tone with a neutral solution of gold, to which no addition of any kind has been made. When all other conditions have been satisfactorily secured, the use of a strong gold solution completes the success, much greater richness being secured than with a weak solution. Mr. Burgess sometimes uses a solution containing a grain of chloride of gold to a drachm of water; but his more usual strength is a grain of the gold salt in from 1 to 2 ounces of water. The time required for toning with a good collodion print and strong gold solution sometimes does not exceed two or three minutes, but generally requires from five to fifteen minutes. The operation is completed, of course, when the black tone is seen through the glass at the back of the print.

As we have remarked, the question of toning is equally important in regard to all the purposes for which developed collodion prints are required. But we cannot forbear, in conclusion, expressing our surprise that a process so simple in its manipulations and so beautiful in its results should receive so little attention amongst portraitists generally. Mr. Burgess gave his process, through our columns, freely to photographers, furnishing full information as to its manipulations throughout. Some of our readers have, from time to time, sent us fine examples of the process, worked according to instructions; but the commercial utilization of the process has not, we think, been at all commensurate with the merit of the process, or with the probable profits it would return.

PHOTOGRAPHY AND THE ABYSSINIAN EXPEDITION.

ON bringing to a successful issue the Abyssinian campaign, it is gratifying to learn that the scientific staff of Royal Engineers attached to the expedition have contributed in no small degree towards the triumphant termination of the affair. Besides rendering invaluable services to the army, and gleanings of information which has added greatly to our former knowledge of Abyssinia, the engineers, surveyors, signallers, telegraphers, well-sinkers, photographers, and others have materially helped to civilise the country, and have left behind them works which will, no doubt, prove to be the germs of enlightenment and progress. A railway of 12 miles was constructed, a grand trunk road leading upwards of 400 miles into the interior was made, the greater part of the country was surveyed and mapped out, and a telegraph line of some length established; and although some of these works were removed and others destroyed before the British left, still their existence for a brief period only was sufficient to show the Abyssinians what can be done by European nations.

It is with that branch of the staff devoted to photography that we have at present to do. As we stated on a previous occasion, the chief photographer in charge of the party was Sergeant Harrold, R.E.; he was assisted in his work by seven non-commissioned officers and men, all of whom, however, with one exception, fell sick before Annelsy Bay was reached on the return journey. The equipment was a very bulky affair; it was divided into two portions, one being styled A and the other B, and each consisted of eighteen boxes. B equipment remained at Senafe untouched, and was returned to England without having been opened, while A invariably accompanied the advance guard until the expedition reached Lal, when, as strict orders were issued to leave all baggage behind, Sergeant Harrold and his companions, in preference to remaining in the rear, parted from their paraphernalia, and went forward as fighting soldiers. Subsequently the equipment was forwarded to Magdala, but arrived unfortunately too late on the afternoon of King Theodore's burial to allow of a photograph of the body being taken prior to its interment. This is very much to be regretted, as, with the exception of a sketch made by Mr. Holmes a few hours after the king's death, and since photographed by the Stereoscopic Company, no authentic portrait is in existence.

The number of pictures taken, amounting to sixty-five in all, are for the most part very fair specimens of photography, and when the conditions under which they were taken are considered, the result is certainly very creditable. A view of lake Ashangi, taken from a distance, with grassy slopes and picturesque foliage in the foreground, is exceedingly pretty, and reminds one very much of a Cumberland or Westmorland scene. The Tacazza and Takasi rivers, the latter supposed to be one of the sources of the Blue Nile, both afford charming views of wood and water. Two panoramic views of Zoola and Senafe, each consisting of three negatives, are very fine productions, and testify to great skill and tact upon the part of Sergeant Harrold and his assistants. Then we have a view of the interior of Magdala, showing the description of architecture most in vogue in Abyssinia, the houses being circular in form, built of bamboo and thatched with straw, and resembling very closely English haystacks. Magdala Church and King Theodore's grave form the subject for another picture; and in the next we see a barn-like building, with a few out-houses, which bears the high-sounding title of "King Theodore's house, treasury, mint, &c." Then we have a faithful sketch of the lofty fortress from which the Emperor first saw the approach of our men, and down the steep side of which his soldiers ran in exulting glee to capture what appeared to be a heavily-laden baggage-train, but which, unfortunately for them, was nothing less than a battery of steel guns. The finest picture of the whole series is, to our thinking, a view of a stupendous

cliff overhanging the Bashelo river; the scene is beautifully lighted, and the mass of granite, which forms a sheer precipice some hundreds of feet in depth, stands out from a mass of dark foliage in bold relief. Lastly, we have several groups of native chiefs, of the European and native prisoners, of Kassai and his staff, of the Queen of the Gallas, &c. The European artisans who made King Theodore's cannon are likewise shown, as are also two daughters of the late Mr. B. H., who in earlier and happier times was the King's Commander-in-Chief and bosom friend. One more portrait deserves mention; it is that of a wearied old man, an Abyssinian fiddler, in his native costume, with his one-stringed instrument upon his knee. His grey locks, thrown back from his forehead, reach down to his shoulders, and impart to his grave, thoughtful face a truly venerable air; he is the bard of other days. The pictures, if not all of them faultless in their production, tell their tale with grave fidelity, and form valuable illustrations to the story we have all read of the Abyssinian campaign.

Accidents with the apparatus and chemicals seem to have been of rare occurrence; everything was carefully returned to its proper place and firmly packed in the transport boxes whenever the day's work was ended and a march ordered. Sensitizing and printing had to be carried on whenever there was a short halt, or in early morning before setting out; but seeing that in many cases the day's tramp began at three a.m., and lasted till eight or even ten p.m., the opportunities for working were few and far between. The sand storms in some parts of the country were very troublesome, frequently blowing over the dark tent, which, in order to be very light and portable, had been made somewhat topheavy. The negatives in the plate-boxes suffered also from the same cause, the sand entering the smallest crevice, and sometimes doing serious damage to the plates. The only other misadventure of importance was the bursting of an ether bottle which had been securely packed in a tin case; the heat was so great that the bottle exploded, tearing the case to pieces and making it go off like a small shell. The stock of albuminized paper failed after the first few weeks, and all the prints had afterwards to be taken on plain salted paper. The albuminized paper was found very difficult of preservation, and became blackened and discoloured very soon after being sensitized, so that its absence under these circumstances was of little importance.

One difficulty seems to have been rather severely felt by Sergeant Harrold, a difficulty which it was impossible to combat, and which is inherent with military discipline. In an ordinary way, a photographer, if he cares at all for his reputation, will insist upon taking an object in his own way; that is to say, at such a time and under such circumstances as he may deem most fit. Now, with a military photographer it is different. He is ordered at once to take a certain object in a certain manner, and any little objections that he may make as to the sun shining direct into the camera, or the objects being on the move or too far distant, are treated as so many excuses, and he is there, not to argue, but to obey; and obey he must. It is for this reason that many of the photographs are taken in opposition to every photographic law, and anything like a successful result could not therefore be expected. However, the chief photographer and his principal assistants, Corporals Gardner and Marshall, seem to have met this difficulty without flinching, and have gone boldly to work in a manner that cannot be too highly commended. Contrivances and makeshifts of all kinds had frequently to be resorted to in a quick decided manner; and, as shown by the results, these arrangements were often the saving of the picture.

There was little need of working with dry plates, as the dark tent was always handy. Sergeant Harrold prepared, however, one batch of dry coffee plates, but was unfortunate in their employment. He received directions to photograph the interior of Addigrath Church, and proceeded, therefore, with his camera and his coffee plates to fulfil his instructions. He had focussed some rude paintings on the ground glass,

and had began to expose his plate, when a high priest or ecclesiastic dignitary of some kind appeared on the scene, and made most unmistakable signs to the effect that he must leave the spot immediately. As the exposure had just commenced, the gallant Sergeant attempted to expostulate with him, in order to gain a few moments until the picture was completed; but, unfortunately, as the period required was somewhat long, and the Abyssinian divine was becoming very energetic, both in his language and action, the valiant photographer deemed it prudent to beat a rapid retreat, in the performance of which strategic movement he unfortunately lost his plates.

A Captain Pottinger, an officer accompanying the expedition, made good use of a camera during the expedition, but his results with dry plates were not, we believe, very successful. He was also unfortunate in not having his apparatus at the front during the taking of Magdala, and was therefore, like the Engineers, unable to secure any view of the battle.

We have had an opportunity of inspecting the apparatus and necessities since their return to England, and the perfect manner in which they were selected, fitted, and arranged for transport reflects great credit upon Captain Stotherd, R.E., and Lieut. Harrison, R.E., under whose care and supervision the staff was organized and equipped. It must be some satisfaction to Sergeant Harrold and his companions to know that, in performing a difficult duty, they have been instrumental in securing of the Abyssinian Expedition many valuable mementos, some of which it would be impossible to replace.

PHOTOGRAPHY IN GERMANY.

BY DR. H. VOGEL.

The Gordon Gum Dry Process.—With the greatest interest I have read your communications on the Gordon gum dry process, and I have repeated the experiments with it with the best results. I have made some trials for determining the relative sensitiveness of the gum process and the ordinary wet process, and I found necessary thirty seconds for a picture on a dry plate, under conditions which required fifteen seconds for a wet plate, using the same collodion and the same baths. I have tried collodions with iodide and bromide of cadmium—the first sample, 1 part of bromide to 2 parts of iodide; the other, 1 part of bromide to 1 part of iodide—but I did not find much difference in sensitiveness.

The Harnecker Dry Process.—Here, in Germany, a new dry process excites much attention—a dry process, indeed, which, from what I have seen, I believe is the simplest known. M. Harnecker, a very clever photographer and chemist, sells a dry-plate collodion. With this collodion one coats a plate and sensitizes it in the following bath:—

Silver	15 grains
Water	135 "
Nitric acid	2 minims

Wash the plate as in Mr. Gordon's gum process, dry it, and the plate is, without any preservative, ready for use.

The plate is nearly as sensitive as a wet plate. I gave with success twenty-five seconds to a Harnecker plate, and twenty seconds for a wet plate, for a picture of the same details and intensity. The Harnecker plate is, after exposure, put in distilled water, five minutes afterwards dipped in the silver bath above mentioned until the plate is evenly coated with it, and is then developed with the following developer:—

Sulphate of iron	1 grain *
Glacial acetic acid	3 grains
Water	220 "
Alcohol	4 to 5 "

* An iron developer of 2 grains to the ounce seems unusually weak; but it is so stated in Dr. Vogel's copy.—ED.

The picture comes as rapidly as a wet plate, and is strengthened in the pyro and silver in the ordinary manner.

I do not know the composition of Harnecker's collodion, but I believe it contains a resin; but it is very curious that the bath does not fog after the preparation of the dry plates as it does with the old sensitive dry plates of Mr. England and others. But, in general, I must confess, that the results of the Harnecker process are excellent.

Perhaps you have already heard of the Mausoleum in Charlottenburg, from our Queen Louise. It is a very dark room, with the celebrated statues of the queen, from the late sculptor Ranch. It was not possible before to make any other photographs of this dark interior except stereo pictures, with very actinic lenses, and these stereos only show a little part of this interior. Recently, Mr. Stiehn had made a large picture of this interior with Dallmeyer's triplet and Harnecker dry plates, in a time of exposure of two hours, and this picture is excellent, and was very much admired in the Photographic Society.

I think the Harnecker collodion will become very important for taking plates in long exposures.

Photographic Seals.—A curious novelty has recently been published here by M. Sturmhoefel, in Freiberg. If you send your card picture and two thalers (six shillings) to M. Sturmhoefel you receive from him a seal with your portrait in relief. M. Sturmhoefel does not state the manner of making such a relief, but it is easy to guess:—Take a transparent positive on glass (perhaps one of your collodio-chloride pictures), print it on Swan's bichromate gelatine tissue, and soak the latter in cold water; then you will receive an excellent inverse relief (the lights hollow, the blacks relief). Make from this a copy in plaster, and from this a mould in metal, and you have the photographic seal.

The German Solar Eclipse Expedition.—In a few days I shall go with my friends, Dr. Zencker and Dr. Fritzsche, to Aden, in Arabia, for taking the solar eclipse; and perhaps it may interest your readers to hear somewhat of our preparations. We are ordered to take (1) prints of the total eclipse (which in Aden continues three minutes) directly with a large single lens of Mr. Steinheil, which is corrected for optical and chemical focus, and which gives a sun picture of 5.6 inch in diameter; (2) enlarged prints of the sun after and before the total eclipse at a diameter of 3½ inches; for making this we have a large refractor, with an excellent clockwork, like the refractor made by Mr. Dallmeyer for the Wilna Observatory, and described in the PHOTOGRAPHIC NEWS some years ago. We have selected Aden as our point of view, because to nearly all other localities where the eclipse is visible astronomical photographers will be sent from other nations, in Siam the Frenchman, in Persia your countrymen, &c. In this manner a photographic series of the different phases of the eclipse will be secured.

Mr. Warren de la Rue has already described especially the manner for taking photographs of the sun, the moon and in a like manner we think to work.

I fear that we are not so well equipped as your English expedition was, as we have only a single apparatus. It would be better to have two or three, for making more pictures in the same time.

We have tried our refractor (heliograph) here on the Royal Observatory, in taking the moon in a like position as the sun will have in Aden at the time of eclipse. The time of the eclipse in Aden is nearly six o'clock in the morning, and the sun will be at that time so low that I fear its actinic power will be very slight. We have taken the moon in a like low position in a bright weather with five seconds' exposure, and have received a well exposed picture in one second time another day, and have necessary twenty seconds for well exposed images. Now Mr. Warren de la Rue states that the prominences of the sun during the totality are about three times as bright as the moon, and therefore we hope to receive in the time of totality (three minutes in Aden) at least three well exposed pictures of the

arious prominences, which are like clouds visible around the margin of the dark moon during the eclipse.

My experiments with different samples of collodion for taking the moon have given some results different from those of Mr. de la Rue. A pure iodized collodion gave a very hard picture, intense in the high lights, but so feeble in the spots of the moon; a bromo-iodized collodion, on the contrary, gave a soft picture, not so intense in the lights, but better in the shadows.

For this reason we will take for the prominence picture during the totality a bromo-iodized collodion.

For the pictures with the bright sun, taken before and afterwards, we shall take a pure bromized collodion, which gives in the objects of very great intensity of light much more detail than a bromo-iodized collodion, which will be very often over-exposed in the shortest time.

We think, also, to make trials for taking pictures of the stars of the south hemisphere and other things of scientific interest. M. Zencker will make photographic studies of microscopical animals and plants of the Red Sea. Mr. Fritzsche will take pictures of the different peoples—Arabs, and others, in Aden. For my part, I think to make artistic and mineralogical and geological studies of the landscape of Aden.

It is proposed that our expedition shall go afterwards to Upper Egypt for taking inscriptions of the hieroglyphics in the temples of Edfer, Dendera, and Luxor.

Mr. Thümigen, the eminent "Egyptologist," will assist us, and signify the point interesting for the archaeology.

I think it will be an interesting voyage, from which I shall return not before the end of October.

In the intermediate time I hope to write to you upon the success of our works; and closing this letter on the "Photography of Germany," I hope to give you in my next an account over the "Photography in Arabia and Egypt."

WASHING MACHINES: THE ECCENTRICITIES OF A SYPHON.

BY NELSON K. CHERILL.

NEXT in importance to the perfect action of the fixing agent used in silver printing is the perfect action of the water used in removing that agent.

It is curious, but at the same time characteristic of photographers, that, until quite recently, the two departments of silver printing on which permanency depends were the very two which received the least attention. It used to be taken as a rule that silver prints must fade, and therefore it did not much matter how soon. Now, however, I hope there will be a little more care bestowed upon the matter; the ventilation the subject has lately received has certainly done much good, and has shown photographers that even though they must not hope for absolute permanency, silver printing may be longer lived than has generally been supposed.

The points which have been brought out are, I think, briefly these: Firstly, that by more careful fixing—using, if necessary, two baths, or one of hyposulphite of ammonia—very much more silver may be removed from the whites of albuminized paper proofs than has been done, as a rule, hitherto. Secondly, that by a more scientific application of water in properly constructed washing machines, very much more hypo may be removed from the prints than has been usual up till now. And, thirdly, that by a judicious mixture of scolding and coaxing in proper quarters, a mounting-board can be obtained with, if not absolute immunity from hypo, at any rate less in it than usual.

These three matters are of so great and vital importance to the success of silver printing, that I propose to give special attention to them, with a view of reporting any observations I may be able to make of a suggestive or useful character.

I have already tried enough experiments with the double

fixing bath to render me exceedingly anxious to try more, and I only await the promised commercial supply of hyposulphite of ammonia from Messrs. Mawson and Swan to investigate the matter fully. I feel it would not be so conducive to practical utility were these experiments made with a small home-made sample of the hyposulphite of ammonia, because the result at which I wish to arrive is one which depends mainly upon the cheap and constant supply of the new fixing agent.

While, however, these experiments are brewing, I should like to say a few words on washing machines in general, and on syphon machines in particular.

It appears to me that the most simple and effective washing machine is that which nature provides—a river. Put your prints in, tied by the hind leg, and, provided there is not another photographer next door above, you may expect the hypo to be pretty well washed out in the course of a very short time. The practical objection to this simple and elegant plan seems to lie in the fact that our brethren of the camera are not, as a rule, landed gentry, and that access may not be had to streams and water-courses with sufficient ease to admit of the plan being adopted as a rule.

The plan next best to the one above mentioned seems the one in which the action of the river is the most nearly approached: constant change of the water, and constant motion when in the water, seem the great requisites, and, fortunately, they are not difficult to obtain. A box with facilities to let the water run in at one end, and out at the other; a tap to let the water in with, and a syphon to run it out—and, if the thing is properly made, there is no need for elaborate contrivances of taps, and cock-and-ball apparatus, and sluices, and levers, and chains, fine things for plumbers to fit up, and "a regular annuity" to "the man" who "looks after such things," but which, even on paper, look more like the early efforts to scheme a steam engine than the latest productions of the nineteenth century in such a simple mechanical contrivance.

It is, I think, probably owing to some slight misapprehension on the part of the schemers of some of these very elaborate contrivances, as to the action of a syphon, that it is so usually considered necessary to make the supply cut off all the time the water is running out of the washing apparatus. There cannot, in my opinion, be a greater mistake: a syphon, when properly constructed, will work enormously faster than it is necessary to supply the water to the cistern, so that though the supply-pipe is running all the time, the cistern may be quite emptied in a very few minutes; and I even consider the action of the water which comes in during the process of emptying very beneficial, because it washes (if I may use such an expression) the water off the prints, and gives them a more complete change than they would otherwise obtain.

It may not, perhaps, appear, on first sight, how it is that a slow running pipe used for filling the washing machine can "start" a large one to work as a syphon for the purpose of emptying it; it might seem, at first sight, that the syphon pipe must be no larger in bore than the filling pipe. But this is quite a mistake. I will try and explain why. The action of a syphon is produced by the pressure of the air upon the water contained in the vessel being emptied, which constantly drives the fluid up the shorter arm of the tube to supply the vacuum which would otherwise be formed by the water running out from the longer arm. It is only necessary to form a current of water in the longer arm of the syphon sufficiently rapid to induce the first flow over the bend at the top to ensure a proper action of the instrument. Now let me explain how a very little water coming into the apparatus may effect this purpose easily enough. Let us suppose a case in which a small inflow of water (say at the rate of 10 pints a minute) has to start a $\frac{3}{4}$ -inch syphon: as the water rises in the apparatus it will, of course, begin by gently overflowing down the syphon pipe by just trickling over the bend of the pipe; the rate of outflow would go on increasing till it was the same as the rate of

inflow; and then it would remain, running in at one end and out at the other without ever starting the syphon at all, but for a very curious and important point, viz. this—that the long leg of the syphon, by going down far below the level of the water in the apparatus itself, gives the water confined in it a very considerable speed in its transit through the pipe, so that the water which only ran quite slowly over the bend of the syphon pipe comes out with quite a rush at the bottom, when it has fallen through some three or four feet. But when water goes through a pipe in this manner—namely, beginning quite slowly as at the top, and running with increased rapidity all the way down—it naturally follows that the air in the pipe gets entangled with the water and carried down with it. The moment this occurs the pressure of the air on the surface of the water in the washing trough sends up some more water into the short limb of the syphon, and so more and more comes down the longer limb, till in about thirty or forty seconds after the first few drops come over, the syphon is at full play, and emptying the trough as quickly as possible.

To ensure the success of this plan, one thing only is necessary, as far as my experience goes; viz., that the longer limb of the syphon must be as *straight as possible*; it must have no eccentric bends or curves to check the progress of the water which comes over first, for it is on the speed of the first few pints that the success of the whole depends.

In setting up an apparatus of this kind not long ago, I found that a bending of the tube only once at right angles, and then carrying it out straight for a few feet, so much took off from the efficiency of the arrangement, that not only would a small influx of water into the tank not start the syphon, but even it did not start when the tank was filled up two or even three inches above the level of the bend; this I quite account for by the peculiar shape of the longer limb of the syphon, which allowed the air to enter freely at the bottom at the same time that the water was running out, thus requiring main force to set up the proper action, and not, as it should be, the gentle influence of the small but rapid flow of water to begin with.

I find that the inflow of the water into the machine is sufficient to cause enough motion in the prints; this refers to only a moderate number, however; when very large quantities of prints have to be washed at once, the ingenious apparatus used in Mr. Bedford's establishment, and described some time ago in the *News*, is most efficient in keeping up a constant agitation of the water and prints; it consists of a flapper kept in constant motion in the water by means of a waterwheel turned by the inflow water.

When the water is draining out of the washing machine, the prints should not lie on the bottom of the trough, but should be provided with a perforated zinc false-bottom on which to drain; this should be kept from the real bottom by slips of wood, or otherwise, so as to be about half an inch clear of it. I find that nothing can be better than three coats of Bates's black varnish to preserve the prints from injury by contact with the metallic zinc. This varnish should, it seems, be renewed every three months or so, as it may require it.

I remember some time ago seeing an account of some experiments with zinc for washing trays unprotected by any coat of varnish; though, in the particular instance referred to, the prints may not have been marked by the metal, I cannot but think that, in all cases, it must be much better to use a coating of varnish to protect the surface of the paper from the metal.

Now all lights—with the exception of those belonging to objects self-luminous, as fire, the sun, &c.—are either the reflections of light from the surfaces of bodies, or transmission of light through those that are transparent or partially so; the focus of light on a globe is, therefore, as much a reflection as that appearance on its shadowed side which, in ordinary language, is called the reflection; and as to the terms half-lights and half-shades, they but express, if literally understood, single degrees among the endless gradations from light to dark."—*Leslie*.

CHIAROSCURO—(continued).

ALTHOUGH there are, between white and black, an infinite variety of gradations, it will be convenient to divide them into light (1), half-light (2), middle tone (3), half-dark (4), dark (5). If a picture were composed of light and half-



1. 2. 3. 4. 5.

light only, the effect would be weak and flat. In photographing distant views, which consist principally of light tones, it will be necessary to introduce some dark object in the foreground to give force and consistency to the whole. Turner has carried this principle to perfection. Many of his most beautiful pictures, full of air and space, consisting chiefly of delicate greys and blue, are brought into focus by the introduction of the dark foliage of the stone pine, supported by some dark spots in the foreground, which is generally light, the darks being united to the lights by delicate and infinitely varied half-tones in the middle distance. Rembrandt's method was exactly the reverse of this, but the same in principle; his pictures are composed of half-dark and dark, having one small focus of brilliant light, united in a magical manner to the darks by half-tone. The marvellous effect of his pictures is due, in my opinion, more to the judicious management of the half-tones than to the strong contrasts and forcible effects of his light and shade. In his pictures and etchings will always be noticed a wonderful transparency in the shadows, which is almost entirely due to the half-tones with which they are associated. Claude, Turner, and Rembrandt were alike in their management in one respect: they always forced the brilliance of their lights by the opposition of the strongest darks. When Claude and Turner represent the sun, they place near it their darkest dark. This effect will always be seen in nature; if the sun is setting behind a tree, the tree will be darker than any other object in the scene. In Rembrandt's portraits the head is often covered with a black velvet cap to increase by contrast the brilliancy of the face, and it will be observed that the other parts are, although dark, in half-light in comparison. This principle is carried out to a great extent in the pictures of Adam-Salomon, where the dark velvet so often introduced plays a most important part in the economy of light and shade.

Light and shade varies so much with the subject to be represented that it can scarcely be reduced to anything like a system. But there are a few general arrangements which the photographer would find valuable to have always before him, and they are only, as it were, duplicates of the laws that govern composition.

In chiaroscuro, as in the composition of lines, the centre is the weakest part of the picture. Neither the principal object nor the chief light should be situated in that place where lines drawn from the opposite corners would intersect. A position either immediately above, below, or at the side of this point would better satisfy the requirements of pictorial effect. In a portrait the head, which is the principal object, and light, would be above this position, in a more or less degree, according to the stature of the individual.

When the light spreads through the picture it should never be allowed to form either a horizontal or vertical line. This refers to the general mass of light. The horizontal bars of light seen at twilight are often very beautiful, and their formal straightness give a grandeur and a sentiment of repose to be produced in no other way. This rule, in

PICTORIAL EFFECT IN PHOTOGRAPHY; BEING LESSONS IN COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS. BY H. P. ROBINSON. CHAPTER XXVI.

"The vocabulary in use relating to light and shade is utterly inadequate to convey that knowledge of its phenomena that a painter requires. It comprises merely the terms light, shade, reflection, half-light, and half-shade."

other words, would run thus:—The centre of the picture should not be light, with the two sides dark, or with the top and bottom only dark. When the light falls or is spread diagonally it is more picturesque than when it is arranged horizontally or vertically. The same rule would, of course, apply to shadow.

There must be unity of effect in the light and shade as well as in the composition. Chiaroscuro will often "pull a picture together" when the composition is scattered. Where there is too great a repetition of forms, light and shade will break them up or mass them together. Chiaroscuro should produce that effect which is produced upon the retina when the eye is intently fixed upon an object, and is not permitted to wander, and which some artists maintain should be obtained by sacrificing the inferior parts of the picture to the principal, but which will not bear the light of argument. The theory is that the eye sees only one point in perfect focus at the same time, and that there is something unpleasant and imperfect, even to the least experienced eye, in a picture where everything is made out—the drapery, the accessories, &c., all minutely represented with the same finish as the head. This is a fallacy that has led many clever painters astray. It is true that the eye, theoretically, only sees one point at a time, but the eye alters its focus so instantaneously that practically it sees one part almost as well as another; and the same rules should apply to the picture as to nature. Notwithstanding that pictures are usually smaller than nature, if the eye is fixed on the chief feature, the other parts, however highly finished, will naturally go out of focus as much as they do in nature, which, as I have already explained, owing to the instantaneous alteration of focus in the eye, is not much. Here is an illustration. As I write I am looking through a window; a few feet beyond the window is the railing of a balcony beyond a terraced garden; beyond that a grove of trees; yet further a church tower; and in the distance some hills veiled in the blue mist. All this is seen through an aperture two feet square, and as I look at it, the focus of the eye changes so rapidly that I can detect no want of definition—such definition as we get in a photograph—anywhere. The only indistinct part is the distant hill.

But there is no reason why this scene, if represented in a picture, should be a mass of mere detail. Sharp, as we call it in photography, it may be all over, but if it is to have pictorial effect it must be massed: the church tower, which is the principal object, must come out into the strongest relief, the rest must be subordinate, and thus we should obtain that unity without which a picture is a thing of naught. The picture is felt to be true and natural when the eye is at once led to dwell on the chief group or the principal object. By insensible degrees, the painter who is a master of his art keeps down the parts which interfere with the centre of attraction—

"All things seem only one
In the universal sun."

And so, after a fashion, it should be in the picture produced by his light.

Unity of light and shade, as I have just stated, is imperative; but there is another quality which at a first glance would appear to be antagonistic to unity, but which really aids it. In a former chapter I dwelt at some length on the necessity of repetition in lines and forms; the same rule, only in a stronger degree, applies to chiaroscuro. No light in a picture should be allowed to be single or isolated, but should be repeated or echoed, not in its full quantity or force—there must be no rival near the throne—but in an inferior degree. The strength of Rembrandt, strange as the statement may appear, was not so much in his great contrast of black and white, as in the manner he harmonized and mellowed the violence of either by echoes and faint repetition throughout the picture. It is the repeated but fainter echoes of the chief light that harmonizes and brings together the various parts of a picture into the unity of a perfect whole. The repetition of the air, varied and

less pronounced, in a piece of music, produces a sympathy and connection of thought throughout. The effect is analogous to that of metaphor or simile in literature: a repetition must not be a symmetrical likeness of its original, but should appear to belong to the same family. It must avoid the symmetry of detail, but produce a sort of wholesale symmetry. What is the secret of the delight we take in reflections, if it is not similar to that we take in bearing the repetition of a sound, or in seeing the echoed sympathy of one part of a picture with another? To many the reflection is more beautiful than the reality. Shelley loved the mirror-like reflections to be seen in forest pools—

"Sweet visions, which in our world above
Can never well be seen,
Were imaged by the water's love
Of that fair forest green;
And all was interfused beneath
With an Elysian glow,
An atmosphere without a breath,
A softer day below."

And Mr. George Macdonald, in his fairy romance and prose poem, *Phantastes*, says:—"Fair as is the gliding ship on the shining sea, the wavering, trembling, unresting sail below is fairer still. Yea, the reflecting ocean itself reflected in the mirror has a wondrousness about its waters that somewhat vanishes when I turn towards itself. All mirrors are magic mirrors. The commonest room is a room in a poem when I turn to the glass."

PHOTO-ZINCOGRAPHY IN PRACTICE.*

BY J. WATERHOUSE, R.A.

CORRECTIONS.

It has usually been stated that the great disadvantage of using zinc for printing from is the difficulty of correcting errors or making additions after the subject has once been put down and etched. If the following directions be observed little difficulty will be experienced. In making corrections care must be taken to avoid touching the surface of the plate with the fingers or to allow the breath or saliva to fall on the plate. In order to prevent this a piece of clean paper should be placed under the hand. A board raised above the surface of the plate should be used to rest the arms on, and a piece of card should be held before the mouth by means of elastic, &c.

Corrections before printing are better made before the plate is etched. Stains, finger-marks, spots, and other imperfections may easily be removed by means of a piece of snake stone, slate pencil, &c. Faint lines may be strengthened with autographic ink and a fine steel pen. Parts may be added by transfer from transfer paper with a small brass roller. If the plate has been etched and rolled in, the following plan must be adopted:—The plate is first covered with gum, and fanned dry. If there is no ink on the part to be altered, remove the gum, and brush the plate with dilute sulphuric acid (1 to 6); this is then well washed with water, and any insertion can be made by being transferred from transfer paper or put in with crayon or pen and ink. The part is then etched, the gum washed off, and the plate is ready for printing. The dry point may also be used for putting in detail, but in this case the print is etched *before* using the point.

If it is required to remove part of the work before making the correction, the plate is fanned dry, a dilute solution of caustic potash is applied to the part with a pen or brush, according to the size of the alteration required. When the ink is removed, the potash is soaked up with blotting-paper, the gum, &c., is washed off, and the part allowed to dry. The dilute sulphuric acid is then applied as before, and the corrections put in. Care must be taken not to allow the alkaline or acid solutions to spread, which may be obviated by placing a mask of card over the surrounding parts.

If the dry point is used the acid is not required; the part

is etched, then covered with gum; the required detail is scratched in with the point; printing ink is then forced into the lines with a dabber made of closely rolled flannel, worked round and round till the lines are well charged. A sheet of waste paper is put over the plate, and a proof is pulled, which drives the ink well into the scratches, and also takes off most of the superfluous ink; the remainder is taken off by sponging the plate, when it comes off with the gum; if necessary, the plate may be washed with turpentine and then rolled in again.

If the part to be altered is large, or the work has been on it for some time, it is better to grain it with a small muller and fine sand, after treating it with sulphuric acid. If the part cannot well be grained, the acid must be allowed to work for a longer time.

FAILURES.

I will now notice briefly the principal causes of failure in each part of the process.

1. *Preparation of the Transfers.* The ink refuses to leave the ground of the print.—The paper has become too old and decomposed, or has been dried at too great a heat. The negative was not sufficiently intense, or the print over-exposed.

The ink leaves the lines.—The print has not been sufficiently exposed to light. The detail in those parts of the negative is clouded over, and hinders the action of light. Ink too soft. Pressure of sponge too great. This fault may sometimes be remedied by taking a little transfer ink on the forefinger and dabbing the lines with it.

The lines ragged and broken.—Under-exposure. Coating of gelatine too thick. The washing water too hot.

Surface of the paper spotted over.—The coat of gelatine too thin. The pressure too great when inking. Use a thicker coat of gelatine, or ink by hand.

The close parts clogged with ink.—Too thin a coat of gelatine. Imperfect contact between the negative and paper. Over-exposure. Excess of ink, too hard or too soft.

2. *Transferring to Zinc.* The ink does not leave the paper, or only transfers faintly.—This may arise from long soaking of the transfers in order to get the ink off. The zinc plate has been kept too long. Too little ink on the print. The transfer too old.

The lines are much spread.—The ink is too soft. The coat of gelatine too thick. Excess of ink, resulting from over-exposure, or from too thick a coating being applied.

The ink does not leave the print in parts.—Uneven pressure while transferring. Uneven drying of the surface of the print after washing, which might be obviated by removing the surface moisture by means of blotting-paper before hanging up to dry.

3. *Printing.* The ink is deposited on parts which should remain clear.—This is caused by the plate becoming too dry, from not having been damped enough before rolling up, or, in hot weather, from the rapid evaporation of the moisture, which may be obviated by the use of the damping mixture before mentioned; but if, by accident, it should occur, as soon as it is observed, the parts should be gently rubbed with a flannel, which will generally remove the ink, or the plate may be damped and the ink removed by rolling in quickly and dragging the roller smartly over the parts.

There is a much more serious defect, which, if neglected, may result in the loss of the plate. It is termed "smutting up." The detail becomes obscured in a black patch, which resists all modes of cleaning. The causes of it are very numerous. Among the principal are:—Etching solution is too weak. Excess of moisture on the paper or stone. Extreme heat or cold. Use of soft bad ink. Dirty sponge. Contact of a greasy body. Friction with the finger. It must be remedied, as soon as it is discovered, by washing the ink off with turpentine, and rolling in again with hard ink, damping with the gum solution.

The lines are doubled or spread. This arises from several causes, among them:—Slackness of the tympan causing it to be too close to the plate, which prevents the free extension of the paper. Use of paper too dry or badly damped, and

of which the edges have become drier than the centre. The remedy is to fix the paper in the tympan, which should be raised slightly off the plate, so that the sinner may act gradually on the paper. Most of the failures in this process are the result of simple mechanical defects, the causes of which are not difficult to discover, and which may be easily remedied.

PHOTO-ZINCOGRAPHY IN HALF TONES.

Photo zincographs of ordinary photographic views, &c., can be obtained, but the results are not satisfactory unless they are considerably retouched. The process is much more suited for the reproduction of architectural details. Some excellent specimens of this process, consisting of views of Netley Abbey, Jerusalem, and Stonehenge, have been published at the Ordnance Survey Office, and I will describe the process by which they are produced. The sensitive transfer paper is prepared in exactly the same manner as for subjects in line, but is kept for about a week before it is used; the effect of this is to slightly decompose the surface and make it more capable of retaining the ink. The negatives should be good, and may be denser than is usual for silver printing, as the paper is more sensitive, and there is no after-reduction of the intensity. The exposure varies from five minutes to a quarter of an hour, more or less, according to the intensity of the light and the quality of the negative. The inking is conducted in the same manner as for line work, but the ink may be harder and the pressure greater. The development is the most important part of the process, and requires great skill and experience to ensure success. The prints, coated with ink, are laid face downward on lukewarm water, and allowed to remain till the gelatine is softened; the surface ink is then gently removed by washing the surface with a very soft sponge and warm water, taking care not to scrub it at all. The print is then immersed in warm water, which is gently agitated, and the detail will gradually appear; the water is changed after a short time, and the operation repeated, the prints being allowed to soak for an hour or so between each change. When most of the unaltered gelatine has been removed and the print appears to have soaked enough, it may be finished off by again washing with sponge and warm water; it is then hung up to dry. When dry, the print will appear darker than a silver print of the same subject, but that will be remedied when it is transferred to zinc. The transfer to zinc is the same as before described. The printing must be conducted with as great care as is required for the finest chalk drawings, and the damping solution must be used.

PHOTO-ZINCOTYPY.

I have made a few experiments with a view to obtaining a raised printing surface on zinc by means of photography, and, from the results I obtained, am of opinion that the process might be practised with success for the reproduction of diagrams, woodcuts, &c., to be printed with type. I have not worked it out thoroughly yet, but will describe the process, in order that others may be induced to experiment in this direction.

A photographic transfer is made on to a fine grained zinc plate in the manner described before. Care must be taken to have the lines very perfect, or good results cannot be obtained. The ink is washed off with turpentine. The plate is rolled in with an ink composed of:—

Bitumen	...	...	...	4 parts
Litho printing ink	...	...	...	2 "
Wax	...	...	...	1 "
Burgundy pitch	...	...	...	1 "
Turpentine middle varnish	...	...	...	1 "

When this is done, the plate is left for twenty-four hours till the varnish is quite dry. The back is then covered with wax or Brunswick black, &c., and the plate is connected with a copper plate at about a distance of a quarter of an inch. The two are then plunged into a 70-grain solution of sulphate of copper, and after a short time the subject will

be found in relief. It is better then to make a cast of it and pile up the white parts. The cast may be stereotyped or electrotyped in the usual way. The process has been practised in France for ordinary work, and, it is said, with success; but I do not think it has been used in conjunction with photography.

THE WET COLLODION PROCESS.

REMARKS UPON THE PRODUCTION OF BRILLIANT PICTURES.

BY C. STERNBERG.*

A BRILLIANT negative is the first thing needful in obtaining brilliant pictures. Every possessor of a portrait album must have remarked how comparatively few of the pictures in his collection have any pretension to brilliancy. Many photographs are sharp and full of detail, but at the same time dull and without vigour, or they are sharp and clear, but hard, and without either detail or half tone. But few specimens are plastic and brilliant, and have sufficient gradation of tone.

A process by which brilliant negatives are obtainable includes, of course, many manipulations with which the experienced photographer is perfectly familiar; but, nevertheless, to the general reader, a recapitulation of the different conditions necessary to their production may not be without interest.

In my opinion, the great source of failure lies in the thickness of the film which forms the image upon the glass plate. Although I am perfectly aware that the negatives of many excellent photographers possess a certain amount of thickness, still I am, nevertheless, of opinion that a really good negative should be thin and perfectly clear. A few points in the deepest shadows should display clear glass, and in certain portions of the high lights an almost perfect opaqueness of the film should be visible; and between these two extremes there should be as many gradations of tone as possible. If few half tones only are present in the negative it is impossible to obtain a brilliant print from the same, as the result will either be weak, or hard, according to the difference in the thickness of the film in the lights and shadows.

Very much to the point are Simpson's remarks on this subject. He says: "Let us suppose that a picture possesses twenty different gradations of tone; in order to be able to furnish a good print, the negative must then be composed of twenty different thicknesses of deposit, which are visible when the image is seen by transmitted light. A negative which begins with perfect transparency, presenting no hindrance whatever to the light in the production of the deepest tones, and which possesses the twenty gradations of tone, is capable of giving a perfectly brilliant result, although it may not appear very opaque in its highest lights. But if the deepest shadows are covered with a deposit equal to ten gradations, then the film in the highest lights must be of a thickness equal to thirty gradations of tone, in order to be capable of producing a good print; if the film in the highest lights is equal in thickness to twenty-five gradations of tone only, it will give less brilliant pictures than the negative first mentioned, although the film may at first sight appear of greater thickness."

Under-exposed negatives generally give hard pictures with large masses of white and black, and without detail or half tones. Over-exposure causes a grey precipitate to cover the picture, which fogs the shadows; a print produced from such a negative is too light in the shadows and too dark in the lights, for everything is lost in half tone, and brilliant lights and deep shadows are wanting; in an over-exposed negative a black coat becomes grey. In developing a plate which has been exposed too long, it is best not to allow the developer to go too far, but to wash as soon as symptoms of over-development are recognizable: in this manner many a picture may be saved.

The collodion to be used must not be too freshly mixed, and should be perfectly clear; its consistence should not be too thin, and it must be sufficiently iodized. Thick collodion should be diluted with equal parts of perfectly pure alcohol and ether.

The sensitizing bath must be prepared from recrystallized nitrate of silver, and should be rendered slightly acid in order to produce perfectly transparent shadows; too much acid exerts the same injurious effect upon the negative as too little. One part silver dissolved in twelve parts of water is a good proportion for making a bath; a saturated solution of iodide of potassium is prepared, and to every 400 grammes of silver solution is added one drop of the iodide and one drop of strong sulphuric acid, as under:—

Nitrate of silver	...	...	30 grammes
Distilled water	...	...	360 "
Strong sulphuric acid	...	...	1 drop
Saturated solution of iodide of potassium	...	...	1 "

If the water and chemicals used are perfectly pure, this bath will give beautifully clear negatives; but should not this be the case, and there is formed upon the picture a grey deposit, capable of being removed by the finger, the bath is purified with a solution of—

Caustic potash	...	...	2 grammes
Water	...	...	100 "

which is added by drops to the silver solution (shaking the latter the while) until a slight turbidity is observed. The bath is then exposed to the sun for a few hours, or to open daylight for some time, when a black precipitate will be formed, which is filtered off. For every hundred grammes of bath is then added 1 drop of acidulated water made by mixing 10 grammes of sulphuric acid with 100 grammes of water. After standing for some hours, the following test should be made:—Coat a plate with collodion, sensitize it, and let it drain well; develop it in the ordinary manner, without exposing, and wash and fix the plate as usual. After fixing, if the glass is not perfectly clear, but is still covered with a thin, light deposit which may be removed by the finger, a few more drops of acid must be added, and the experiment repeated: too much acid must never be added at any one time, and care must be taken that the plates used in the experiments are perfectly clean. As the deposit upon the plate may likewise be caused by the action of light, all chemical rays must be carefully excluded from the dark room.

The addition of organic substances to the developer is extremely favourable to the production of brilliant negatives. The three following formulæ are recommended:—

I.—Sulphate of iron	...	...	25 grammes
Loaf sugar	...	...	40 "
Glacial acetic acid	...	...	15 "
Water	...	...	500 "
Alcohol	...	...	15 "
II.—Sulphate of iron	...	...	10 grammes
Loaf sugar	...	...	40 "
Glacial acetic acid	...	...	10 "
Water	...	...	400 "
Alcohol	...	...	1 gramme
III.—Sulphate of iron and ammonia	...	...	22 grammes
Gelatine	...	...	1 gramme
Glacial acetic acid	...	...	8 grammes
Water	...	...	300 "

With regard to the latter, the gelatine is dissolved in the acetic acid and 50 grammes of water (this will take several hours), and the sulphate of iron dissolved in 250 grammes of water, and both solutions are then mixed. In general it will be found that weak developers produce opaque negatives, and strong developers negatives of an harmonious character. No. II. developer is suitable for summer work, and for strongly-lighted pictures. The developer should be used sparingly, for the employment of too much solution impairs

* *Photographisches Archiv.*

the brilliancy of the negative. For intensifying I would recommend,—

Sulphate of iron	...	...	1 gramme
Citric acid	...	...	1 "
Water...	...	...	100 grammes,

to which a few drops of a weak solution of silver is added.

To judge of the intensity of a negative in the dark room is by no means an easy matter. If the chamber is illuminated through the medium of a yellow window the task is rendered more difficult, from the fact that the intensity of the daylight is continually varying; and on this account one is very liable to be led astray. For this reason I would recommend that the process of intensifying be carried on with the aid of a lamp or candle screened with yellow glass.

CAUSES OF FOGGING.

BY JABEZ HUGHES.*

"Fogging;" that is, a darkening of the film all over, directly the developing solution is applied.—This defect has several sources. It may exist in a small degree, only slightly obscuring the shadows of the picture; or it may be to so great an extent as to prevent its appearance. Fogging often troubles the young beginner, and as it arises from many causes it is often difficult to assign it to the right one. Sometimes deleterious vapours are the reason; as, the dark room being built over a stable, and filled with reeking vapour; the room being newly painted with a slow-drying paint; a leakage of gas; a bottle of ammonia with a badly-fitting cork or stopper. A remedy for any of the above is simply to remove the cause.

In extremely warm weather the developing solution is much more energetic, and fogging may thus arise from this increased energy: remedy, dilute it one-half, or double the quantity of acid. The following are, however, the most usual causes of fogging:—

Alkalinity of nitrate bath: remedy, addition of acetic acid till litmus paper is slightly reddened.

Extreme acidity of nitrate bath: remedy, addition of oxide of silver or ammonia until litmus paper is only slightly reddened.

Omission of acetic acid in the developer: remedy obvious.

Over-exposure in the camera: remedy obvious.

Diffused light in the dark room. If yellow calico be used, it has, perhaps become bleached, and must be replenished; or additional folds must be used. Sometimes chinks of unsuspected white light are the cause; if so, they must be stopped up.

Diffused light in the camera or the dark slide, admitted through a joint giving way, or an old screw-hole, or the parts of the camera not fitting: remedy obvious.

Nitrate bath made with impure silver, or bad water: remedy, add a few drops of saturated solution of bicarbonate of soda until the bath solution remains turbid after shaking; then expose it to the sun for a few hours and filter; acidify it if necessary.

Newly-mixed collodion will sometimes cause fogging; it then requires to be kept for a few days, when it may work clean; or it may be mixed with some older collodion, and may then be all right. Sometimes a little more acid added to the bath or the developer will be a remedy. If none of these aids are sufficient, then the collodion must be rejected.

When you make any change—such as having a new camera, a fresh nitrate of silver bath solution, a new quantity of developer, or another sample of collodion—you may be

able at once to suspect, and perhaps detect, the cause; for if some change occurs in the nature of the pictures which did not exist before, it is very probable that this fresh circumstance is directly connected with the changed character of the pictures. Therefore, whatever it is that has been newly introduced should be carefully examined, and very probably the cause of the fogging may be discovered. When, however, you have no such clue, you must adopt a systematic method for its discovery. The following is the plan:—

First, examine your dark room by covering your yellow window with some material that entirely excludes *all light*. Crevices and cracks admitting white light may then be seen that before were unnoticed, and some of them may have shone on the glass during its preparation, and caused fog. If these are found, they must be stopped up, and your annoyance may be over.

If these be not the cause, next suspect the window, for though it may admit only yellow light, it may not be yellow enough. Yellow materials become bleached, and require renewing, especially yellow calico. To test your window—and it is very important that you be quite certain on this point—proceed as follows:—Collodionize a plate as usual, and immerse it in the bath; then cover up your yellow window entirely, or leave only the smallest possible chink, so that you can just see what to do. Take your plate out of the bath and put it in the dark slide. Now remove the covering from the yellow window, and draw up the shutter of the dark slide *half way*, to expose *one half of the plate*; keep the plate to the light of the window for (say) five minutes, then replace the shutter, close up to the window as before, so as to exclude the yellow light, and proceed to develop your plate. Keep the developing solution on about the usual time that is required to produce a picture, for you will not be able to see what is going on; then wash and fix it. Now restore the light and examine the plate, and it must present one of the three following appearances:—Case A, the half exposed to the window is drab, and the half not exposed is quite clear and transparent; Case B, it has a drab deposit—in other words, fog—all over it; Case C, the plate is perfectly clear and transparent all over.

We shall examine each of these cases in succession. Case A shows that the yellow window is at fault, for half the plate exposed to it is fogged, but the other half is clear; therefore sufficient actinic light passes through the window to injure the plate. The yellow covering, if bleached, must be removed, or more coverings must be supplied, and a plate must be tried after each addition, until you have your window so yellow that a plate may be exposed five minutes without being fogged. Yellow glass sometimes allows light enough to pass through to fog the plate; such glass should be removed and a better sample put in its place. I have seen a piece of yellow-brownish glass, though very dark in colour, that admitted actinic light almost as freely as white glass. This is rare, but in photography you try all things, and only hold fast to that which is good. If the window be discovered to be the cause of your trouble, it must be covered with fresh calico, tannin, silk, paper, glass, or other yellow material, or it may be painted yellow; but in some manner the light must pass through a yellow screen in such a way that, while you are permitted to see your manipulations, your plate must remain without fog. You must have no rest until this is accomplished. This done, your fogging trouble is over, and you may proceed to work in comfort; for case A clearly showed the window was the cause of the fog.

It should be borne in mind, however, that the amount of protection that a yellow window gives to sensitive plates depends upon the quantity of light that falls upon the window. Plates may be fogged on a day of sunshine, and yet be perfect on a dull day. A yellow window with a western aspect may suit a morning light, and yet cause fog in the afternoon. When the window of the developing room is thus exposed to a variable light, it should be provided with an additional moveable yellow curtain, to be used when a stronger light than usual falls on the window.

* Extracted, with permission, from the new edition of the "Principles and Practice of Photography," just out.

If the cause of fogging has thus been satisfactorily traced and cured, it will form an excellent lesson. But as there are other causes of fogging than an imperfect yellow window, let us examine Case B.

Case B, the plate darkens all over under the action of the developer, and you can distinguish no difference between the two halves; this shows that your window is quite right, and you must seek further for the cause. It must now lie between the bath, the collodion, and the developer. First try the bath: test it with a strip of reddened litmus paper, and if it changes to blue the bath is alkaline, and an alkaline bath is a certain cause of fogging. Add acetic acid, drop by drop, testing between each addition, until blue litmus paper is *very* slightly reddened. Again try a plate; the fogging will probably not be quite gone, but much reduced: add a little more acid until it entirely disappears.

Suppose, however, that the reddened litmus paper did not change colour, then test with blue litmus, and if it turn *very* red, carefully neutralize with oxide of silver or ammonia, until only a slight acidity remains; then resume your trial to see if you have expelled your enemy, for excess of acid, especially nitric, will cause fog. Should the test papers show that the bath is neither very acid nor alkaline, the probability is that the error is in the developer or the collodion.

Make up, carefully, a fresh developing solution, being particular not to omit the full proportion of acetic acid. You may even increase the quantity of acid, for some samples are weak, and you may happen to have one; the developing solution, unless it have its proper addition of acid, will always cause fog. If the new developing solution rid you of your difficulty, well and good; if not, you must suspect your collodion. Some collodions cause fog; therefore, get some fresh, and let it have a little colour—a pale golden, for instance—for colourless collodions are more prone to fog than coloured ones. If you are not now relieved, you may assume that the nitrate bath is the defaulter, for it must be one of the three. Make up a new bath, and if you use good silver and clean water you are almost certain to be out of your trouble.

In this way, by carefully and exhaustively examining one thing at a time, you will be certain to trace out the delinquent material. If you have decided that the nitrate bath, for instance, is the cause, then you have, if it be a new one, to find out whether the sample of nitrate of silver is pure, or whether the water is not the cause. The latter is frequently an unsuspected source of trouble. Again, if it be found that the developer is at fault, supposing it to be correctly mixed, each of its components may be suspected and examined in turn—the iron, the water, the acetic acid, and the alcohol. Some samples of methylated alcohol often cause great annoyance by impurity.

To return to our examination: supposing that we have not yet discovered the cause of our fog; the conditions of Cases A or B not applying, let us examine the rest.

Case C, the plate develops perfectly clean and transparent all over; this shows not only that the yellow window is all right, but that the chemicals are right also; in fact, that the origin of the fog must be external to the dark room; and as nothing else but diffused light can now be the cause, we must seek to discover it. First examine the dark slide well; in some unsuspected manner it may admit light to the plate.

If your dark slide be found to be perfect, next examine your camera carefully. You may test it in this manner: prepare a sensitive plate as usual, and place it in the camera as if you were going to take a picture; put the cap on the lens, draw up, *half way only*, the shutter of the dark slide, but do not uncover the lens. Let the plate remain thus for a full minute, then develop and fix the plate. The plate will either be one-half fogged, or it will be quite clear all over. If half be fogged, it shows that the camera admits light in some other manner than through the lens, and thus the fog is caused. To know where the light is admitted, remove the ground

glass; and, excluding all light with the focussing-cloth, put your head into the camera (the lens being still covered), and you will see the light streaming in. You may examine the interior of your camera in another manner. Place the dark slide in its place, and draw up the shutter; remove the lens, and, with the aid of the focussing-cloth again, examine the interior through the flange aperture. If any stray light be admitted, you will see it reflected from the face of the plate. It is necessary, when thus examining the interior of a camera, to wait for a few minutes, to allow the eye to get accustomed to the darkness, or you may deceive yourself, and think there is no light, from your momentary inability to perceive it. The cracks, crevices, or holes being stopped up, your trouble is passed.

Should your plate, however, develop clear all over, it will show that the interior of the camera is perfect. Another cause of fog may arise from the lens itself. If a strong light fall on it, particularly sunshine, fog will certainly be produced. A screen or shade should be provided, so that no light fall on the lens, except from the objects that are being delineated. Occasionally there is reflection from the sides of the lens tube, or the edges of the back lens. Dead-black varnish will be the remedy in these cases.

If you have not now traced out the difficulty, having run through your chemicals and apparatus, it most probably is caused by an error of manipulation, such as over-exposure, or a deviation from the proper mode of developing. It is scarcely probable, however, that you could pursue this inquiry without already having a clue to the real cause; and I have gone through the series of exhaustive experiments to show you that, by this method of inquiry, you may succeed in tracing not only fog, but almost any other trouble, to its true source.

Correspondence.

INFORMERS AND PIRACY.—GRAVES *v.* MERCER.

SIR,—We should much prefer to have remained silent as to your introductory remarks in the case of "Graves *v.* Mercer," reported in your number of the 10th inst, had not "The Defendant" of his own accord rushed into print. We forbear to remark upon any of the numerous inaccuracies in the letter signed "The Defendant," unless under the advice of our solicitor in the case, which would necessarily involve so much delay in our replying as to lead your readers to suppose that we accept "The Defendant's" assertions as unanswerable. We may perhaps venture to encroach upon your space at some future time, but meanwhile we would remind "The Defendant" of the old proverb, "Don't holloa till you're out of the woods." Others quite as confident and as plausible as "The Defendant" have, nevertheless, eventually come to grief.

As regards the employment of so-called *informers*, we, more than any, do regret that the law should be so ineffective as to leave us no other alternative, in the face of the many *dodges* adopted by dealers and others engaged in this illegal traffic, than the use of such means, in order, in some measure, to defend ourselves from the acts of persons not over-scrupulous as to the proper constructions of "menin" and "tunn."

Had you had the experience that we have had of the difficulty in tracing out these matters, in order to suppress a traffic ruinous to ourselves, but doubly serious as it affects the fine arts in this country, we cannot but think you would readily endorse the opinion expressed from the Bench by one of our ablest London magistrates, that "we are justified in adopting any means short of felony" in such cases. We have selected as we consider respectable men, who are under our own control, and we see no reason to question either their truthfulness or their sobriety. We trust sincerely that the law in this respect will ere long be amended, so that the necessity of proving a sale will be done away with, and some other more simple, speedy, and effective remedy provided.—We are, your most obedient servants,

HENRY GRAVES AND CO.

6, Pall Mall, July 22nd, 1868.

Talk in the Studio.

A VALUABLE TONING BATH.—A correspondent signing "Silex" says:—"Mr. Bovey lately gave us an unfailling toning bath. I can give you another, but mine is not a new one. However, it is worth repeating. I have used it for two years without a single failure, and with several samples of paper. Before that time I had used the acetate, but, like Mr. Bovey, I found there was no certainty with it. As sometimes a new bath, mixed only twenty-four hours, often refused to tone at all, I purchased the following formula from a travelling process-monger for 10s. 6d., and I have felt thankful to him ever since. I think it has since been made public in the News. It is this:—3 grains chloride of gold, 20 grains chloride calcium, about half a teaspoonful of powdered chalk, 20 ounces common water. It must be mixed twenty-four hours before use, or with boiling water one hour will be sufficient. It never refuses to tone, and will keep; and more gold, chalk, and calcium may be added to it, although I generally make it fresh after re-uewing it two or three times. I never saw a mealy print produced by it."—[The examples sent to illustrate the action of this bath are very excellent.—Ed.]

ANOTHER PHOTOGRAPHIC DETECTION OF A MURDERER.—The brutal murder of the wife of a coffee house keeper in Norton Folgate, and the escape of the murderer, a youth of nineteen, will be fresh in the minds of many. He has been recently discovered solely by means of a photograph. A youth, giving the name of George Jackson, was recently committed to Maidstone Gaol for a theft at Woolwich. As we have before explained, photographs of prisoners and persons "wanted" are circulated amongst our prisons as a means of detection or identification. Among others, the photograph of the boy Andrew Mackay, the absconded murderer, was sent to the prison. For some time it did not appear to have attracted any attention, but a thought suddenly seemed to have struck a warder belonging to the prison that the boy Jackson, who was under his charge, resembled one of the photographs of persons who had absconded after the commission of a crime. In consequence of this he communicated his suspicions to Major Banuister, the governor of the prison, and examined the photograph carefully, and this confirmed the suspicion he had entertained previously, that the prisoner George Jackson was in reality the murderer Andrew Mackay. He took an opportunity upon this to enter into conversation with the prisoner, and in the course of it he asked him if he had ever gone by any other name than George Jackson, and he at once replied that his name was Andrew Mackay, and he admitted that he was the person who was charged with the murder in Norton Folgate. Major Banuister at once telegraphed to London to Serjeant Duuaway, an officer of the metropolitan police, and he went down to Maidstone yesterday, accompanied by a person who was acquainted with the lad Mackay, and who at once identified him as the person against whom the coroner's jury returned a verdict of wilful murder.

PHOTOGRAPHY IN CHICAGO.—A recently established American "Art Journal" of considerable merit gives, in its notices of "Art Teaching and the Studios" in Chicago, a highly complimentary notice of the new establishment of our old friend Mr. Carbutt, whose occasional articles our readers are always glad to find in the News. The critic points out the fact that Mr. Carbutt is catholic enough in his taste to exhibit conspicuously in his gallery examples by the best artists of Paris and London, amongst the latter our friend Mr. Blanchard is mentioned, expanded into a firm as "Valentine and Blanchard."

NEWMAN'S DIAMOND VARNISH.—We have received from many correspondents very warm praise of Newman's diamond varnish, and our own experience has confirmed all we have heard. We always avoid, however, giving notices of any article which might be construed into puffing. We hold that if a good thing be kept prominently before the public, by the legitimate process of advertising, it will make its way without puffing. A fact regarding this varnish has, however, just been brought under our attention which ought to be recorded. A correspondent states that a negative varnished with it was left out recently the whole of a wet night, and then, when taken in, the print was forgotten until it was dry and firmly stuck to the negative. The print was, however, again

moistened, and, by the aid of a little care, removed without the varnished surface of the negative suffering the slightest injury.

BROMO-IODIZED INDIA-RUBBER.—A method has been patented in the United States of incorporating india-rubber with bromine and iodine instead of with sulphur, which is generally used in producing vulcanized india-rubber. By adding to iodine one-half its weight of bromine, proto-bromide of iodine is formed, and this, when combined with rubber or equivalent gum, will produce a composition which will harden on being subjected for about an hour to a heat of 250° Fah. Owing to the volatile properties of proto-bromide of iodine, it cannot be applied without difficulty to practical purposes. To obviate this difficulty, we treat both the bromine and iodine, prior to combining the same, with oil of turpentine, or similar oil, which has previously been mixed with about one-fourth its weight of sulphuric acid, to prevent the formation of an explosive composition. The paste mixture produced as above described is combined with caoutchouc or equivalent gum, in the proportion of about three ounces of the paste to a pound of gum, the proportion of gum being increased if a more elastic product is desired. Can any photographic use be found for such a compound?

BLACK VARNISH.—An aniline black varnish, of recent Parisian production, is the following:—In a litre of alcohol, 12 grammes of aniline blue, 3 grammes of fuchsine, and 8 grammes of uaphthaline yellow are dissolved. The whole is dissolved by agitation in less than twelve hours. One application renders an object ebony black. The varnish can be filtered, and will never deposit afterwards.—*Scientific American.*

A PHOTOGRAPHER in Canada advertises as follows:—"Deceased persons taken at their own residences." "Parties wishing to learn the business can do so cheap."

A WESTERN ARTIST (?) in "An Ode to All," gets off the following in his circular:—

"Oh, who would live where Art is unknown,
Where shadows of dear and loved ones are not?
Perhaps of those who for country died without a groan,
Or even of those who went of too much 'pot.'"

"FIXING A DYE."—A report on the colouring matters derived from coal tar shown at the French Exhibition has the following:—"A dyer, like all others of his craft at that time, was busily occupied experimenting with the aniline dyes. Amongst other things he tried a reaction which had been described by M. Lauth at the end of 1861, viz., that of aldehyd on a sulphuric solution of aniline red. In this reaction a substance is produced which gives to solutions an extremely evanescent blue colour. M. Lauth had given up all idea of utilizing this blue colour in practice, and M. Cherpin endeavoured to fix the same colour on silk or wool with similar want of success. His attempts, although fruitless, were incessantly renewed, exhausting his purse, but not his patience. One day, however, discouraged at the want of success attending some recent experiments on which he had founded great hopes, he was on the point of relinquishing the attempt at conquest over this fugitive blue, when the idea struck him to confide his troubles to an old friend, a photographer. 'A trouble shared is a trouble halved,' says the proverb. Cherpin proceeded to test this saying, and experienced the reward of his perseverance and his confidence in the consolations of friendship. He found his photographic friend, and confided to him the history of all his hopes, his experiments, and his fruitless results.—'Fix the blue?' said his friend. 'Is that the only difficulty? Why it's the easiest thing in the world! Have you tried hyposulphite of soda?'—'Hypsulphite of soda? *Mon Dieu*, no! Do you think it will fix my colour?'—'Of course it will. Don't you know that hyposulphite of soda is the fixing agent *par excellence*, and that when we want to fix anything in photography, that is the substance we always employ?' Happy he who possesses faith! Cherpin tried hyposulphite of soda, and his joy and admiration of the chemical knowledge of his friend may be imagined when he saw his blue colour metamorphosed into a splendid green, this time perfectly stable. It is scarcely necessary for us to add, that the mode of action of hyposulphite of soda in this case is entirely different from its photographic action, and that it would be quite impossible to predict the one by knowing the other. This anecdote contains a moral. It shows, in our opinion, not the result of chance—for that is common to all the world, for where is the discovery to which chance has not more or less contributed?—but it shows the power of

the will, the power of perseverance. Chance only favours two kinds of persons: those sufficiently instructed or endowed with talents eminent enough to observe it, to seize it, and to profit by it; and those who, by patience, perseverance, and the power of their will, force it in time to become useful to them.

To Correspondents.

MR. BOVEY'S METHOD OF TONING.—In answer to the various querists who have written on this subject, we regret to state that hot weather and close application to dainties have, during the last few weeks, prostrated Mr. Bovey, and he has been instructed by his medical adviser to abstain from all kind of labour, bodily or mental. He is, we are glad to add, recovering, and hopes shortly to answer the various questions addressed to him.

P. C. (Subscriber).—The necessity of forcing the intensifying process until the whole image is buried in a universal dark deposit, in order to obtain sufficient vigour, may arise from several causes. It may be due to the use of a new or thin collodion. If it be from using a new collodion, the addition of a little of an old sample will help you. If from the collodion being thin, the addition of a little more pyroxyline to the collodion will help you. The use of the gelatino-iron developer will probably help you; or the use of a weaker developer, containing a little more acetic acid, may help you. Take care not to over-develop, and in intensifying use plenty of acid in the solution. By intensifying after fixing you may probably get rid of your difficulty.

J. W.—The print you enclose has the appearance of being a reproduction, not printed from a negative from life. If it be from a negative from life, we should judge it to be a thin, flat, fogged, imperfect negative, from which it would be difficult to obtain a good print. The print itself is, however, a poor, mealy one; but whether it would be possible to get one much better from the negative we cannot say without seeing it.

ANSWER.—We have met with examples of opal glass with the surface of which the silver image seemed to combine, and remained perfectly visible after removing the collodion. We do not know of any remedy except procuring another sample. We have tried almost every method of cleaning without removing traces of the image. We presume that the material used in obtaining the opal surface has an affinity for silver, and readily combines with it. The example of the Eburnum process you enclose is very good indeed.

W. M.—You will find it difficult either to weigh or estimate with accuracy the iodide which has deliquesced. You had better employ it in making an aqueous solution of iodine, to be used in intensifying, in which absolute accuracy is not necessary.

SILEX.—Thanks for your further remarks. The subject is very interesting, and we shall be glad to examine it as carefully as possible. 2. Undoubtedly the quantity of tungstate of soda you mention is erroneous. It should have been 20 grains. It has doubtless been an error of the press. 3. The infinitesimally small proportion of chrome alum necessary to render the gum insoluble, used for retouching prints, would not, we think, produce any action on the silver image. 4. Which is the ivory process you use?

W. B. B.—The photographic qualities of the card forwarded are very excellent indeed; the tone is unusually rich, and the print is at once vigorous and delicate. The lighting is good, although, for our own taste, we should have preferred a little more direct side-light, to pick out points of high light on the face.

W. J. A. G.—It is one of the puzzles in connection with photographic practice which we have not been able to solve, that some persons who succeed well enough with the wet process fail signally with almost all dry processes. In describing their operations they appear to comply with all conditions of success, but in result they meet with nothing but failure. Yours is not a solitary case by any means. In trying the morphine process again, proceed as follows:—Take the collodion, either 2, 4, or 6, add to each ounce an additional grain of bromide of cadmium, agitate until it is dissolved, and then allow it to rest a few days. After coating and exciting the plate, allowing each plate to remain somewhat longer in the bath than usual, transfer the plate to a dipping bath of distilled water, where allow it to remain until another plate is ready; then transfer to a dipping bath (or dish) of common water, there to remain until another plate is ready. After that, again rinse with distilled water, either in a bath or poured on; then apply the morphine solution; allow it to remain on the plate a minute or two, and then throw it off, and allow the plate to dry. Give such a plate three or four times the exposure of a wet plate, and develop with a gelatino-iron developer to which a few drops of silver solution have been added. The collodions we have men-

tioned, with the added bromide, may be used for either Mr England's or Mr. Gordon's process.

SORE BESET.—When fog assumes the character of a dull grey deposit between the film and glass, it is generally the result of using dirty glasses; but the same thing sometimes arises from under-exposure and pushing the development and intensifying. Sometimes the white-looking deposit you describe on the surface of the negative is due to using a water for the developer containing much of a chloride or of a carbonate, and chloride or carbonate of silver is thrown down on the film. If your acetic acid is pure, the use of considerable addition of it in the developing or intensifying would probably prove a remedy; but if it be not pure, every addition would only increase the evil. In a recent case of persistent fogging which came under our attention we found it due to the use of an impure sample of acetic acid, which contained a reducing substance. Try the use of the gelatino-iron developer; it is a great aid to the production of clean shadows; also try, if necessary, intensifying after fixing instead of before. See article by Mr. Hughes in this number.

J. S.—The spots on the excited paper forwarded are due to irregular drying of the surface; the silver solution, instead of draining off and drying off evenly, collects in drops, which dry very slowly, and wherever a drop rests a light-coloured spot appears, which prints of a blue tint. The cause of this irregular drying is not quite certain; it is alleged by one manufacturer of albuminized paper to be due to the dry and horny state of the paper at the time of exciting; another manufacturer asserts that the use of a nitrate bath too strong will cause it. It is easy to try the remedy implied in both cases: allow the paper to remain in a damp place a few hours before use, so that it shall not be absolutely bone dry when floated. Also use a weaker bath: we believe that no commercial sample of albuminized paper requires an 80-grain bath; as a rule, a 40-grain or a 50-grain bath is strong enough for all commercial papers. A certain remedy for the spots, when others have failed, consists in blotting off the excited paper on clean white blotting-paper after exciting.

B. MAGIC.—As a rule, a 15-grain iron solution is strong enough, especially for summer use; but in presence of dull light, under-exposure, old insensitive collodion, excess of acid, or other retarding conditions, double that strength may be required. The example enclosed with the 30-grain developer is certainly better than that with the 15-grain solution. The former is very good, but the light is a little too directly in front.

YOUNG.—When you speak of a plate coming out of the bath black, do you mean that it was literally black? If so, some very curious addition must have been made to the collodion by some one. We have seen a plate blacken all over with fog on applying the developer, but never saw a plate black when it came out of the bath. 2. So far as you describe your operations with the honey process you appear to have acted rightly: why your results should be wrong, and your experience different to that of others, we cannot tell. 3. The collodion you mention is rarely sold iodized; but it appears to us incredible that you should purchase a sample of iodized collodion by a maker of high repute, and not be able to get an impression with it. We shall have pleasure in trying it. 4. In our hands the ebonite baths have proved satisfactory; but there is nothing so satisfactory as glass, and if used with care in a proper travelling case there is little risk. 5. In many cases a swing bath is useful in portraiture. 6. Your question as to the use of the carbon process can be best answered by the patentees. Write to the Autotype Company, 5, Haymarket. 7. Either will answer well, but probably No. 1 best. 8. The cabinet portrait enclosed is very good indeed.

WM. PIMLOTT.—It is somewhat difficult to give an answer to your question in this column. When you ask how to take transparent photographs for the magic lantern, we are uncertain how much you know, and at what point to begin to give you hints. You will find, however, tolerably full instructions in an article on page 73 of our last YEAR-BOOK. Get that, and if, after reading it, you require further information, write again.

Several Correspondents on our next.

Photographs Registered.

Mr. A. CLARKE, Stonbridge,
Photograph of Captain Roberts.

Mr. A. NICHOLLS, Cambridge,
Photograph of Christ's College Donkey Race.

Mr. SLINGSBY, Lincoln,
Photograph of Lord Monson.
Photograph of The Broad Tower, Lincoln Cathedral.

All Communications for the Editor to be addressed to 15 Gough Square, Fleet Street, London, E.C.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Collodio-Chloride Printing Process	361
On the Restoration of the Negative Film	362
Foreign Miscellanea	363
Sketches of Travel from a Sun-Painter's Portfolio. By Stephen Thompson.....	363
On Retouching Negatives. By Dr Vogel	365
Pictorial Effect In Photography. By H. P. Robinson.....	366
Two Simple and Practical Methods of Printing upon Ivory. By David Duncan.....	367

	PAGE
The Diamond. By James Martin.....	367
On the Measurement of the Luminous Intensity of Light. By William Crookes, F.R.S., etc	368
Proceedings of Societies—Liverpool Amateur Photographic Association	370
Correspondence—Removing Silver Stains from Opal Glass—Washing Machines	371
Talk in the Studio.....	371
To Correspondents	372

COLLODIO-CHLORIDE PRINTING PROCESS.

It has been our good fortune during the last three or four years to receive from various parts of Continental Europe and from America many examples of collodio-chloride printing, and letters of thanks for having given the process to the public. Some of the most promising examples which have come under our notice are those produced on the paper prepared by Herr Obernetter, of Munich, which may be kept sensitive for many months. We had heard much of excellent results of this paper, and seen various fine pictures produced upon it, before we were informed of its precise character; but in the course of some recent interviews with Dr. Liesegang, the able editor of the *Photographisches Archiv*, he informed us that the Obernetter paper, which was extensively used in Germany, was simply the result of an application of our collodio-chloride process. He kindly gave us various hints based upon his own experience in working with the paper, which we put to the test in some experiments upon a sample of the paper submitted to us for trial, the results of which we shall place before our readers.

The paper possesses a highly glazed and delicate surface, possesses about the same sensitiveness as excited albuminized paper, and readily receives any tone, from a rich chocolate tint to a blue-black. According to the information we received from Dr. Liesegang, the basis is one of the ordinary enamelled papers, in which the surface is prepared with some white pigment. This is treated with gutta-percha dissolved in chloroform, and finally with collodio-chloride of silver. The use of a paper the surface of which is formed of a neutral pigment which does not combine with silver seems to be an essential element in the keeping qualities of the sensitive paper. In our experiments with collodio-chloride of silver we have found that English papers prepared with animal size most readily discoloured, whilst a commercial sample of enamelled paper treated with collodio-chloride of silver has kept in our hands for upwards of a month without any deterioration whatever. Certain qualities in the collodio-chloride of silver also modify the keeping properties of the paper prepared therewith: of these qualities we shall probably have something to say shortly.

As a further illustration of the effect of a surface of neutral pigment, as a means of securing keeping qualities in paper prepared with collodio-chloride of silver, we may mention here some examples recently brought under our attention by Mr. W. H. Smith, who has been giving some attention to the subject. Some months after the publication of our collodio-chloride process Mr. Smith patented a process of printing with gelatino-chloride of silver, which he has brought to great perfection for printing on wood: he has also tried the same material for

printing on paper, but not with sufficient success to satisfy himself. The examples of collodio-chloride printing which he recently brought under our attention were exceedingly fine. The paper was first prepared with a neutral white pigment, china clay having answered best. This pigment, being mixed with a suitable size, is applied to the paper and rolled; this is followed by a coating of a solution of india-rubber, and then the collodio-chloride is applied. The paper is found to retain its sensitiveness for some time: an example placed in our hands for trial was unchanged at the end of a month. In some cases a slight tint is given to the enamel surface, and the points of high light being scratched out in the finished print, the effect of a drawing in black and white chalk on a tinted ground is obtained.

One of the advantages claimed for the Obernetter paper is its fitness for development, so that in dull weather printing is expedited. The paper is exposed under a negative for a minute or two until a mere trace of the image is seen, and then, on the application of a developer, a vigorous print of fine colour is obtained. The developing solution proposed consists of—

Gallic acid	...	...	...	$\frac{1}{2}$ drachm
Citric acid	...	...	...	7 grains
Water	...	...	...	2 ounces

After development the print may be toned with the toning bath recommended for the paper generally, which we shall state presently, and fixed and washed as usual.

With the example of the Obernetter paper placed in our hands we produced a score or two of good prints, all presenting a vigorous and rich effect in the printing bath, and readily assuming in the toning solution a rich deep sepia tint, or purple brown. The toning bath recommended, and which we used, is prepared in the stock solutions as follows:—

1. In 50 ounces of distilled water dissolve—
Sulphocyanide of ammonium 1 oz. 2 drachms
Hyposulphite of soda ... 45 grains
Bicarbonate of soda ... 15 „

2. In 50 ounces of distilled water dissolve—
Pure chloride of gold... 30 grains

If the double salts of gold and sodium or potassium are used, take the double quantity.

The two solutions keep any time. Mix equal parts of them. The mixture can be used at once. The prints never become yellow in this bath.

In two to ten minutes the prints are toned. Wash them in water, and fix in—

Hyposulphite of soda...	...	1 oz. 2 drachms
Distilled water	...	32 ounces

Five or ten minutes will suffice.

For washing, two or three hours will be sufficient.

In the qualities of delicacy and richness, and the perfect rendering of every detail in the negative, nothing could surpass these prints; but we nevertheless found certain drawbacks, not inherent in the process, but due to traceable causes. The first defect was one to which any paper sent out ready sensitized must be liable, but to which this paper seemed especially sensitive: we mean a tendency to imperfect toning in patches wherever the prepared surface has been touched by damp or soiled fingers, the impression of finger marks in many cases being rendered distinctly visible in the course of printing. Another difficulty consisted in the liability of the prints to break or scratch whilst in the various solutions. This appeared to be due to two causes: the thin and inferior character of the paper on which the pigment was applied to form the enamelled paper. This thin, soft paper quickly absorbs a good deal of water, and becomes limp; the pigment on its surface remains, on the other hand, tolerably waterproof and rigid, and, receiving little support from the limp paper on which it rests, there is a tendency to easy breaking or cracking. The final disadvantage is one partly due to the paper and partly to the quality of the collodion used; the film in many cases curls from the edge of the print as soon as the whole becomes perfectly desiccated. This is not a necessary defect; we found it occasionally in our experiments when first working out the collodio-chloride process, and quickly found the remedy in the use of a less horny and contractile collodion. But even when this tendency is present from the use of an unsuitable example of collodion, it may be to a considerable extent counteracted by mounting the prints before they are absolutely and unmanageably dry. Our friend, Dr. Vogel, who speaks very highly of the paper, states that the addition of nitrate of soda to the toning bath has been found also to check the occasional tendency of the film to leave the paper.

In order to secure the best results and to avoid the failures which commonly attend experiments with a new process, certain suggestions and cautions are issued by the manufacturer of the paper, with a summary of which Dr. Liesegang kindly furnished us. They run as follows:—

The printing is best effected in diffused light.

The prints should be washed in three changes of common water before toning, and as these waters contain much free nitrate it should be saved.

Never break the paper; cut it with a scissor or sharp knife.

In the first washing water the prints curl very often; but in the gold bath, if the print side is put downside, they will become flat again.

Do not put too many prints into the gold bath nor into the hypo, or they will get red stains.

Cut the prints while they are in a wet state with scissors, and mount them directly before they are dry; mount with fresh starch.

The prints obtain their finest beauty by rolling.

Coat with wax varnish.

CAUSES OF FAILURE.

1. *The prints become browned in the gold bath, and do not tone.*

Too much hyposulphite in the fixing bath, or the chloride of gold is not pure. Try whether the gold bath is acid, and, if so, add bicarbonate of soda until it is neutral. Acid gold baths do not tone, and makes the collodion film come off from the paper. If the gold bath is not acid, and does not tone, the bath does not contain enough gold.

2. *The collodion film comes off from the paper.*

(a) The paper has been broken.

(b) The prints have not been sufficiently washed before toning.

(c) The gold bath was acid.

(d) The solutions were too concentrated. If the solu-

tions are more concentrated than indicated, the film will surely come off.

3. *The prints have not sufficient gloss.*

Coat them with any good enamel varnish. Prof. Bottger's, of Frankfort, formula (copal dissolved in alcohol) is recommended.

We conclude this desultory article on the subject of collodio-chloride printing by giving a formula as stated by Dr. Vogel to be successfully used by Herr Voigt for development printing:—

Twenty grains of nitrate of silver are dissolved in an ounce of alcohol, diluted by a small quantity of water. The nitrate should be powdered finely; it will dissolve very slowly. To the solution is added, with constant agitation, one ounce of plain collodion containing 2 per cent. cotton, and half a drachm of an alcoholic solution containing 16 grains of chloride of calcium; lastly, 1 or 2 drops of a strong solution of citric acid are added. With this collodion unsized paper is coated in the dark, in exactly the same manner as a glass plate in the negative process. When the paper is dry, it is exposed under the negative until the outlines commence to show, and is developed with—

Water	1,000 parts
Pyrogallie acid... ..	$\frac{1}{2}$ part
Citric acid	$\frac{1}{4}$ to $\frac{1}{2}$ „

Add a few drops of silver solution, in case the development should progress too slowly. For toning, Obernetter's gold bath, with sulphocyanide of ammonium, is used.

ON THE RESTORATION OF THE NEGATIVE FILM.

In the *Photographische Correspondenz* M. Alois von Anreiter communicates a method for restoring negatives injured by the formation upon their surfaces of blisters or vermicular markings. These defects, which are the result of exposing negatives to a damp and variable temperature, or of varnishing the plates before they are thoroughly dry, M. Anreiter remedies in the same manner as that pointed out recently by M. Bloede, in the *Philadelphia Photographer*, and by Mr. Spiller in this Journal as far back as August, 1864.

The method prescribed is a very simple one. Instead of covering the negative with alcohol, and pouring the same on and off continually until the varnish is removed or softened, such as was formerly done, the plate is placed in a bell jar, or supported in a flat earthenware dish, the bottom of which is covered with spirits of wine, and placed in a warm locality; the utensil is covered up, and the spirit then evaporates and becomes condensed upon the varnished surface. After a short time the film becomes so soft that the inequalities on its surface collapse of themselves, or may be pressed down by means of the finger; if the operation is prolonged, the whole of the varnish will be dissolved away, and a fresh coating of the latter must then be applied when the plate is again dry.

Mr. Spiller's present mode of operating to remove the varnish or restore the film of a negative is as follows:—The plate is placed inside a deep porcelain dish, varnished side downwards, each corner of the negative being supported by a small piece of cork about an inch in height. A little methylated spirit, just sufficient to cover the bottom of the dish, is then poured in, and a piece of blotting-paper somewhat smaller than the negative is moistened with the same spirit, and placed upon the top of the plate: care must be taken that the sheet of blotting-paper is not too large, and that it is merely moistened, and not fully impregnated with the spirit. The dish is then covered up and placed in a warm locality, when the spirit evaporating from the blotting-paper will keep the plate cool, thus favouring the condensation of the alcoholic vapour upon the undermost and varnished surface of the negative. The dish should never

be placed in a temperature higher than 100° Fahr., and under these conditions forty minutes or one hour will suffice to moisten the film thoroughly.

On taking the negative from the dish, it is placed face upwards upon a flat surface, and if the blisters do not go down of themselves, they are pressed gently with the finger; or, should they be veritable air-bubbles, pricked carefully with a pin's point. The plate must be held occasionally against the light for inspection, as many of the markings which are shown by reflected light are invisible when the negative is regarded as a transparency.

Foreign Miscellanea.

THE commission appointed by the French Photographic Society to award the medals for the year 1867 have presented their report, in which they recommend the names of Mr. John Talbot and M. l'Abbe Laborde to receive these distinctions.

M. Pector, at a recent meeting of the French Photographic Society, exhibited some pictures printed on matt lepto-graphic paper, which had been kept untuned and unfixed for a period of eighteen months in a drawer screened from the light. Some white paper, and prints upon glazed paper of the same description, had been stored in the same place, but these were completely destroyed on their immersion into water.

The *Photographische Mittheilungen* speaks in high terms of praise of a work just published by M. J. Grasshoff on retouching photographs. Being practically acquainted with every branch of the subject, M. Grasshoff's printed experiences should command a wide circulation.

The commission appointed by the Prussian Government to take note of the forthcoming total eclipse of the sun includes three photographers, viz., Drs. Vogel, Zenker, and Fritzsche. These gentlemen left Berlin in the middle of July for Aden, where they propose to make their observations.

M. Johannes Bienert discusses in the *Archiv* the relative value of certain varnishes, and points out that in many cases of splitting of films the mode of preserving the negatives is more at fault than the composition of the varnish. According to his experience he has never known the films of any of his negatives to crack when preserved in a locality of even temperature, but that when they are stored in glass studios or light out-buildings where the temperature is constantly changing, accidents of the nature in question are of frequent occurrence. A varnish which has been patented in France by M. Hanfstengl may be recommended very strongly; it is thus composed:—

Alcohol 80°	...	...	1000 grammes
Bleached shellac	...	...	100 "
Venetian turpentine	...	...	20 "
Sandrac...	...	...	10 "
Mastic	...	...	5 "

M. Bienert prefers to use in this recipe a somewhat stronger alcohol than that mentioned, viz., 92° to 93°; stronger than this, however, the spirit should not be, as it is otherwise apt to dissolve away the collodion film. A good varnish, which may be used with but little warmth, but which should only be employed for negatives kept in an even temperature, may be made with—

Ordinary turpentine (thick)	...	16 grammes
Venetian turpentine	...	16 "
Sandrac...	...	80 "
Sugar and camphor, of each	...	1 "
Alcohol 92°	...	600 "

Finally, M. Bienert gives the formula of a positive varnish to be rubbed over photographs by means of a small tuft of

cotton wool, and which, notwithstanding its curious composition, is said to impart a beautiful gloss to the prints:—

White wax	...	...	11 grammes
Ether	...	...	32 "
Normal collodion	...	...	24 "
Alcoholic solution of white shellac (not too strong)	...	...	16 "
Alcohol...	...	...	8 "

Dr. Liesegang makes a few remarks upon international photographic nomenclature. He complains that words are often badly rendered in translations, and that sometimes the very reverse of the writer's meaning is expressed. As an instance, Dr. Liesegang cites the English word "discolouration," which has been translated into *décoloration* and *entfärbung*, signifying bleaching or becoming colourless; in this case, if the discolouration of the whites of a print is being alluded to, the translation is a simple reversal of the original sense. Other words of a technical nature are often quite untranslatable, and the doctor therefore suggests that in order to render such terms intelligible they should be illustrated by wood cuts, or, better, by original photographs. As a recent example, Dr. Liesegang alludes to M. Carey Lea's article upon "blurring," a term which is used by that gentleman in quite a different sense to what it is employed by Hardwich in his *Manual of Photography*, and it must therefore receive a different translation. Dr. Liesegang suggests the compilation of a German-English-French photographic dictionary which should contain all the acknowledged terms used in the photographic journals of the different countries, and which should, moreover, be copiously illustrated with photographs.

In the *Photographische Correspondenz*, Professor Pisko describes Ladd's new magneto-electric machine, which he recommends for photographic purposes in connection with Foucault's or Serrin's electric lamp. He states that an apparatus of this description yields, at the distance of one metre, a light equal in intensity to that of the sun in March during mid-day.

M. Wendling, in the same journal, contributes an article on the fading of photographic prints. He lays great stress on the employment of pure water in manipulating the prints, and suggests a careful purification of the same prior to its employment in the toning and fixing operations.

SKETCHES OF TRAVEL FROM A SUN-PAINTER'S PORTFOLIO.

BY STEPHEN THOMPSON.

No. 2.—SKYE SCENERY.

SKYE is a *wraith* to the denizens of Cheapside and High Holborn, and even to the majority of travelled men. It looms out of the grey mists of the Northern Sea like a ghost in some wild Norse legend, told by the light of a dying fire. Skye is like a fossilized sea-king, storm-beaten and scarred all over with grisly seams and rents. Robed in cloud wreaths and ever gathering rain-swirls; the hem of his sea-bound skirts hollowed out along the shore into weird-like caves of grotesque and fantastic shape by the worn weary waves; grottoes where the night winds sigh and the kelpies keep court and revel. The *entourage* is in perfect keeping with "the subject." The grey torn sea that seethes around "MacLeod's Maidens,"* with their breasts of foam, and breaks with wild wolfish leap into the hollow caves that fringe the shore between Loch Scavaig and Loch Slappin, is not more savagely picturesque than the dark splintered peaks of the Cuillin Mountains. Riven and split in every direction, their serrated crests have an outline as sharp and jagged as a saw, and their craggy ledges foster the callow eaglet still. The "beauty of repose" is the antithesis of Skye. Ever the wind blows and the

* Three spires of rock rising sheer out of the sea on the coast of Skye and shaped like women.

fleecy vapours gather around "Blaavin" and "Cornisk," and break and reform into solid phalanx, and break again like armed hosts on a fiercely-contested battle field. The untempered breeze that always ends each gust with a swirl of rain on your unprotected head, is the same as that which played amid the yellow locks of the Vikings! Visions of storm-tost Norwegian galleys bearing the banner of King Ilaco, or Tørrquil, or Sigurd, naturally fill the foreground. The very names of rock and headland, from Vateruish to Trotternish, tell of other and earlier associations than oars. The Norse element is uppermost—a leaven that leaveneth the whole mass. The boatman, as he rows, sings you long interminable Gaelic songs embodying Norse legends, melancholy in their monotonous chant, but which have taken his imagination captive in boyhood, over peat fires in Skye-boths on drear winter nights, and will never leave him more. The very pipes, for which Skye boasts a rude college, though they can sound a love song, seem only to *speak* when raising the wailing coronach or the impetuous battle march.

Sea-birds perch on every crag by the shore, and eye your camera with a shy and puzzled look. Cormorants and curlews scream around you and fly across your field of view. You grow familiar with Solan geese and the lonely scart with outstretched neck and attenuated wing; sea swallows abound, with their keen restless eye; and even seals sometimes disport themselves before your eyes. You will see, too, the golden eagle wing his majestic flight: where else more fittingly, if the Laureate paints from nature?

"He clasps the crag with hooked hands,
Close to the sun in lonely lands,
Ringed with the azure world he stands.
The wrinkled sea beneath him crawls;
He watches from the mountain walls;
And like a thunderbolt he falls."

At certain seasons it is never dark here. I have been out on the hills all night, and the northern lights glowed till dawn, like

"As mournful light
That broods above the fallen sun."

There is something strange and abnormal even in the outline of some of the mountains—"Glamaig," and especially its companion, the monstrous "Marsco," where Hilda, the Scandinavian Princess, was laid, after death, with her face turned towards Norway, that her spirit might have rest.

"I wept out all my tears. Amongst my kind
I cannot sleep; so upon Marsco's head,
Right in the pathway of the Norway wind,
See thou and make my bed.
And upward to a sea-orerstaring peak,
With lamentation was the Princess borne,
And, looking northward, left with evening meek
And fiery-shooting morn."

Here, then, within two days' sail of the Broomielaw at Glasgow is a new sensation for the *blasé* tourist! The Pyrenæes are more beautiful; the Alps more picturesque (and of a height beside which no Scotch mountain can be named, and comparisons are odious); but Skye and the *Cuchillins* are unique—a wild desolate picture to hang in your mental gallery—full of the wild-flavoured poetry of a bold restless race, beside which our own seems effeminately tame. A London swell—no; for some of them can climb a big Alp or steer a yacht with any one—say, rather, a Parisian exquisite in tight pantaloons and black shiny sticking-plaster boots, would find himself not simply in a foreign country, but in another world—the first stage on the way to Hades.

I believe it may be said that the wildest and most historically interesting part of Skye had never before been photographed; indeed, it is almost impossible to do it, and but for a lucky termination of a most hazardous venture, my own fate would be best described by the homely but graphic simile of a dog coming home with his tail down. There is no place for your base of operations other than the shelter afforded by the little inn in Glen Sligachan, and the mere excursion thence to the *Cuchillins*, and the scenery of the *Lord of the Isles*, occupies the whole of a long day, and leaves

no time for photographing. Thus, through Glen Sligachan to Camasunary, four hours; thence by boat (10s.) round to Loch Cornisk, one and a half hours; allow for stoppages, launching boat, &c., say another hour:—total, six and a half hours. The same time is occupied in returning, making altogether thirteen hours. By using dry plates and starting very early, enough time might be gained for exposing them, though not for much selection of points of view. But the scenery, with its every-varying cloud and rain-swirl, is just that most difficult to render satisfactorily by a dry process. Hazardous as it was, after ascertaining as a matter of certainty that there was *one* human habitation where I might find shelter at Camasunary, and be nearer the "*Cuchillins*" than in Glen Sligachan, I determined, to the consternation of some of the passengers, on being landed from the steamship at Loch Savaig, and trusting to the resources of an old mountaineer. Accordingly, I was landed in a small boat on the spot described in the *Lord of the Isles* as that where the Bruce landed—

"Where a wild stream with headlong shock
Comes brawling down a bed of rock,
To mingle with the main."

The silence and solitude of the place were most oppressive. After scrambling over some large boulders and crags, I hid my cases of apparatus in one of those caves such as abound nearer Prince Charles's Cave—where he was hidden by Flora Macdonald—and *Bloody-Nose-Point* (which last ought to be painted by Telbin for a sensational drama), and then essayed the scramble round the rocky shore towards the solitary farmhouse. After proceeding some distance I reached a point inaccessible to the foot of man in the (at that time), state of the tide, but was greatly relieved by finding a boat with some queer specimens of the old Gael, who volunteered to take me to Camasunary Bay for "ten shillin'," nearly all the English they could muster. I objected, and finally made a bargain for "six shillin'." A place was made for "the gentlemen" amid a lot of old crones and children, whose clothing may be described as nothing in particular; a bit of ragged tartan wrapped round their middle and secured with—well, a bit of string. The children eyed me curiously, and scanned my costume, particularly the buttons of my coat, as if they had never seen any civilized being before. After landing and reaching the little roof seen from the steam-packet in the morning, imagine my horror on finding it *uninhabited*! Some repairs were being made, and the family had migrated for the time. However, an old gillie who had been there for some purpose came to the rescue, and, after a long corrobory, I elicited that if I could cross the hills I should find in the lone district of Strathaird an equally lone house—Dr. McAlister's—where I might obtain shelter. The hills looked formidable in the gathering rain-mist, but there was no choice, and girding up my loins like an antique, and donning a modern mackintosh, I commenced the ascent. After an hour or so the rain became heavy, and the mist thickened so much that it was almost impossible to keep the track. I lost it repeatedly, but after reaching the highest point caught one glimpse, and but one, of a white building far away. This reassured me. To keep the sheep-track was impossible in the waning light, so I struck off through bog and slush, as the crow flies, in the direction where I had caught a glimpse of a roof with my glass, oblivious of everything but reaching it before darkness closed upon me, knowing well, by former experience, the danger of a night on the moors. Again imagine my feelings after a long tramp, with the nervous system braced up to a degree of tension that renders it super-sensitive, to find, on reaching the point to which my instincts and not my vision had safely led me, that it was but the white walls of an abandoned kirk, desolated, like many others, by the disruption in '43, when the great emigration of pastors, with—in some cases—their whole flocks, to Canada took place. I cannot say that my heart sunk within me, or that anything sensational took place, but I felt queer, though believing I should get through it somehow, although the *how* was not then

very apparent. Again I struck out; this time following "a burn," in remembrance of an old Highlander's advice given me twenty years before, under somewhat similar circumstances, in the Perthshire Highland; "Follow a burn, sir; always follow a burn; it's sure to lead to some place of abode." It did lead, indeed, to a rude bothy, where two old hags were sitting, like the witches in Macbeth, over a pot above a peat fire, but silent and contemplative. From them I learned the way to Dr. McAlister's, of "Strathaird," mentioned by Sir Walter Scott in his Notes to the "Lord of the Isles." A real Highland welcome awaited me, and dry clothes in exchange for my dripping garments, and the pleasure of cultivated society, for the doctor's house is a kind of sanatorium for officers and others who may have suffered from the effects of climate or a too free indulgence in the pleasures of the mess-table; and in this lone retreat from all temptation I found Crimean and Indian officers, who had regained that health amid the wilds of Skye which they had sought in vain elsewhere.

My way was now clear. The pressing invitation of the worthy doctor to make his house my base of operations, as it was so much nearer than the inn in Glen Sligachan, made the scenery of Loch Coruisk and the Cuchillins *un fait accompli*. The doctor's Skye ponies conveyed us over the hills each day, and boats awaited us thence to Loch Scavaig. Captain L. and Captain B. made pleasant what would otherwise have been a physical impossibility; Malcolm was the best of gillies; Ronald the best of ponies—when you let him have his own way, which sometimes brought him to grief. What fishing and what photographing we had! Wet through were we nearly every day, and sometimes unable to effect a landing on the rocks for the surf and swell; but what matter? a warm welcome always awaited us, and seawater never inflicts cold. That seal we just missed shooting; that eagle which passed so near; that tremendous sea we shipped, and spoiled the tobacco and cigars, were all afterwards pleasant recollections. Night-fishing was popular and exciting. Captain L., after a successful night on Rat Island, planned a night at Loch Coruisk. Malcolm collected drift-wood for a bivouac fire by a cave thereabouts the day before, and provender sufficient was taken at the time. Talk of a formal London dinner party!—that night, by the lonely shores of Loch Coruisk, under the shadow of the "Coolins," was something to be remembered for evermore. A successful day, both with fish and negatives, was closed by a night with nature in her wildest aspects. Around us was the scene which Scott makes Bruce describe:—

"The good Bruce to Ronald said,
 'St. Mary! what a scene is here!
 I've traversed many a mountain strand,
 Abroad, and in my native land,
 And it has been my lot to tread
 Where safety more than pleasure led;
 Thus many a waste I've wandered o'er,
 Clombe many a crag, crossed many a moor:
 But, by my halidane,
 A scene so rude, so wild as this,
 Yet so sublime in barrenness,
 Ne'er did my wandering footsteps press,
 Where'er I hap'nt to roam.'"

The night was fine, and the echoes for which this place is remarkable sounded still more strange. A gun fired gave a prolonged reverberation like the noise of the Dutchmen's bowls heard by Rip Van Winkle in Sleepy Hollow. The Alma was reascended by the light of a bivouac-fire of drift-wood, amid the smoke of cigars and tobacco. Such a summer night was all too short, and long before we were wearied of it, Coolin's Cliffs glowed red in the morning sun.

But all things must come to an end, and the moment of my departure, too long delayed by the urgent hospitality of the whole party, at length arrived. After another day like the preceding ones, a late dinner, an evening cigar, and Malcolm was ordered to have the horse and dog-cart ready at twelve p.m. for a long midnight ride through the mountains to Broadford Bay, to catch the Hebridean steamer

at five a.m. going south. One brought a rug, another a watch-coat that had done duty in many campaigns, another cigars, another something else, and, amidst hearty farewells and real regret, the horse's head was turned southward. The night was chilly, and the huge hills stood out dim and mysteriously on either hand, except in one quarter, where the Aurora Borealis glowed like a reflection from some great conflagration until morning dawdled. In no part of the Alps or the Appenines have I seen a sunrise to exceed in beauty that which spread itself above the Rosshire Hills on that morning. The steamer stood in for the bay soon after five p.m., and, with a good-bye and a gratuity for Malcolm, I jumped into the boat waiting to take me to the packet. Another long day of dreamy quietude while steaming along the coast and through the Western Islands, and late at night the red lights streaming across the bay told me we were going into Oban.

ON RETOUCHING NEGATIVES.

BY DR. VOGEL.

[A recent number of Dr. Vogel's *Mittheilungen* contains two prints from a pair of card negatives of the same person at the same time: one negative is touched to remove freckles, spots, and physical imperfections, and the other left in its natural photographic state. The improvement effected by working on the negative, without in any degree altering the likeness, is very great indeed. We subjoin a condensation of Dr. Vogel's article on the subject.]

There was a time when photographers used to take a pride in furnishing untouched pictures, and were apt to regard with feelings of disdain any photograph which required subsequent mending or beautifying.

The object to be fulfilled in retouching is to rectify inherent faults in a picture. These faults, or imperfections, are of two kinds, viz., those produced through the ignorance and carelessness of the photographer, from insufficient illumination, faulty exposure, bad manipulation &c., and those which may be said to be inseparable from the art of photography, which, as the painter justly observes, gives too much detail, and renders the unimportant points of a picture with as much force and vigour as the important ones; moreover, in the reproduction of lights and shadows photography is sometimes guilty of exaggeration, depicting the former too glaringly, and the latter too darkly, and when different colours are included in the picture, often reversing the order of their brilliancy. For the first named imperfections the photographer is alone responsible, and retouching for the purpose of covering up these faults is certainly a practice to be deprecated; on the other hand the employment of a method capable of correcting blemishes inherent to the art itself is quite as justifiable as the subsequent finishing process to which an engraved copper plate is subjected prior to its deposit in the printing press.

As M. Grasshoff remarks in his recently-published work on retouching, the rectification of faults may be brought about either by a previous treatment of the original object, prior to its being photographed (as, for instance, by powdering or covering up dark spots with ultramarine), or the modification may be effected upon the negative or the positive. There are, therefore, three kinds of retouching; viz., the original, the negative, and the positive methods; the last being the least recommendable on account of its being the least permanent. Pictures improved by this method are affected by simple rubbing, whereas retouching by the other processes secures positives which are as permanent as perfectly untouched photographs, inasmuch as any improvements which may have been effected are copied into the paper. Besides, in using the positive retouching process the work has to be repeated for every separate print, while one retouched negative will yield several hundred serviceable positives. For this reason the negative process is most frequently practised, and has been in vogue in some establishments as long as fifteen years. Rabending, of Vienna¹

was the first to call public attention to the method, and although it is still regarded by many photographers with some contempt, this mode of retouching is extensively employed.

With reference to the technical elaboration of the negative retouching method, M. Lindner [the photographer who furnishes the illustration] remarks:—"The retouching takes place upon the varnish. In several experiments of retouching, undertaken upon the plate prior to its being protected, I remarked that the subsequent application of the varnish altered the opacity of the material employed, whether it was blacklead or colour, in the same manner as the negative itself is altered. The operation may be performed in two ways; the easiest and quickest method being to employ a blacklead pencil (Faber's No. 3 or 4, according to the composition of the varnish) for the purpose, and where the intensity of the lead is not sufficiently great, to cover up with darker colours. A negative retouched in this manner does not, however, possess anything like the delicacy and brilliancy of one manipulated with a pigment possessed of light-covering properties, yielding an uniform film,—as, for instance, a mixture of Chinese white and sepia. As the colour must be laid on in a dry state, and very sparingly, it is necessary to work with a soft brush, as a hard one would require a considerable amount of moisture to render it sufficiently pointed for the purpose. As a support I use the well-known transparent retouching plate."

"This is the whole of the process as seen from a technical point of view; as regards artistic finish there is naturally plenty of scope for one's talents. For instance, the outline of the nose may be improved, the eyes may be opened wider, the mouth may be curtailed (by skilful covering up of the corners), further improvements being afterwards made upon the positive, if desired. The lights may likewise be modified by the application of colour to the glass surface of the negative, and the shadows softened down; the latter being well effected by the employment of carmine. Details in the drapery, the hair, or background, may also be effected."

According to M. Lindner's process, then, it will be seen that not only is it possible to correct any faults which may arise in photography, but it is likewise possible to cover up any imperfections existing in the original. Large noses may be made small, dark spots may be lighted, old women may be made young, and, in fact, the method may be regarded as a perfect "Adonisising process;" indeed, so effective is it, that if extensively applied in studios, ladies of doubtful age might always be asked the question how old they desire to appear in their pictures, whether above or under fourteen years of age. We will not, however, recommend the carrying too far of any retouching process which, while it may gratify the vanity of the public, and thereby help to fill the pockets of the artist, fails to reproduce the truth.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXVII.

"The highest finish is labour in vain, unless, at the same time, there be preserved a breadth of light and shadow. It is a quality, therefore, that is more frequently recommended to students, and insisted upon, than any other whatever; and, perhaps, for this reason, because it is most apt to be neglected, the attention of the artist being so often entirely absorbed in the detail."—SIR JOSHUA REYNOLDS.

CHIAROSCURO—(continued).

The light and shade of a landscape cannot be materially altered by the photographer, nor is it necessary that he should do so; but the chiaroscuro of nature is so continually changing that he may select the effect that gives the most pleasure to the educated eye. A few sketches of the arrangements of light and dark as employed by the best artists may assist him in making his selection.

It is desirable that all lights should have a focus, just as light falling on a globe is more brilliant on one small spot

than on any other part; and all lights in a picture should be treated as parts of a whole, and subordinated in various degrees to the principal light. Fig. 1 represents a simple form of chiaroscuro much used by many artists. In this

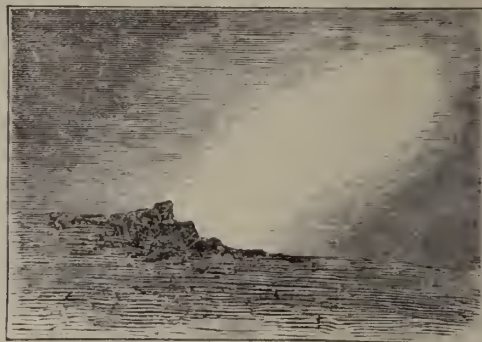


Fig. 1.

arrangement the highest light is opposed by the darkest dark, and the light fades away in every gradation of middle tones. The two extremes assist each other by contrast, and produce a most forcible and startling effect, with great breadth. It will be found in the works of Bonington, Collins, Cuyp, Both, and many other painters of coast and flat scenery, to which it is well adapted. Many admirable examples—especially by Collins—may be seen in the South Kensington Museum. The reverse of this, in which dark takes the place of light, is shown in fig. 2. This effect may



Fig. 2.

often be noticed in moorland scenery or in a flat country, when the clouds graduate upwards from a dark horizon. The shadow of a cloud may be thrown over the distance, while the foreground may be illuminated by intense sunlight; or the effect may be caused by belts of trees. However produced, the effect is very beautiful, and is one that, now greater attention is paid to passing effects and the sky, may be easily produced in photography. In this arrangement a mass of extreme dark in the light part of the foreground will be found invaluable; or, still better, a figure or other object in which is combined the extremes of black and white. This will be found to throw the rest of the picture—consisting of gradations short of black and white—into harmony, by creating a focus, as it were, more brilliant, and overmastering the other lights and darks in the picture. Turner's "Temeraire" is an example of this form of composition.

In figure 3 the darkest shade is relieved by a light object, and the highest light by the principal spot of dark. Burnet, in writing of a similar design, says:—"If a diagonal line be drawn through the picture, and the extreme dark and extreme light be placed at opposite sides, we must of necessity have the greatest breadth of effect. If a balance or union between the two sides be wished, there is no other way but by borrowing a portion of the one and exchanging it for a portion of the opposite; and not only may this prac-

tice be made use of for the harmony of the whole, but the light and the shade will be thus rendered more intense by



Fig. 3.

the force of opposition. Now, whether the dark which is carried to the light side be very small or very large, and *vice versa*, we have the groundwork of some of the most powerful and most natural effects. If the light is placed near the horizon—as in evening skies, for example, such as it frequently is in Cuy—we see it rising upward until lost in middle tint in the upper part of the picture, and the middle tint descending into shadow by means of trees, figures, &c., thus making a sweep round the picture, and thereby affording the greatest opportunity for breadth of effect. If the two extreme points are connected by intermediate figures, so as to form but one group, we have the greatest firmness, as the light part of the group will be relieved by a dark ground, and the dark part of the group by a light ground; if we pursue the contrary practice, and place the dark part of the group on the dark ground, we have more breadth and softness of effect. There is no want of examples in nature or in pictures to warrant our following either mode."

It is, perhaps, necessary to state that the illustrations are purposely exaggerated to show the effect more clearly, but the truth of nature should never be violated to produce an effect. Photography gives facilities for approaching sufficiently near to the rules of art without that. Midnight shadows should never be mixed with the light of day, even in painting, although it has been managed with great effect by some great masters of the art—Tintoretto and Carravaggio for instance. Leslie says: "This is the boldest fiction of chiaroscuro, but it is generally managed by the painters I have mentioned with such address that it silences criticism, and forces us to admire, whether we can approve or not. All that can be said in its defence is, that the elements of such a combination are from nature, though united as nature does not unite them. Conventionalities like this must be forgiven to genius, but I do not think they are to be recommended to imitation; and in saying so I have no fear of repressing the daring of genius, for genius—such as the men I have mentioned possessed—will always have its own way. Great ability may, however, exist short of theirs; and I would gladly repress all who possess it from attempting things which the success even of greater painters cannot entirely sanction. And there is much need of this caution, because it is far more easy to imitate exaggeration of effect than to make simple truth so impressive as it has been made by Paul Veronese, by Claude, and by the best painters of the Dutch and Flemish schools, including Rembrandt, when he pleased to be included."

Photographers, therefore, must never rely on the excuse for departing from nature, "Painters did it thus." They must not defy, but court criticism—leaving themselves at liberty to reject it if it is obviously wrong—and they must rely on nature for success. Photographers even of "daring genius" cannot afford to depart from nature, as these old painters did, partly because nature is a sure guide, and partly because it has not yet been settled what "daring genius"—as far as it applies to photography—really is.

THE DIAMOND.

BY JAMES MARTIN.*

A FEW practical hints and observations may now, perhaps, prove of service to those of your readers who may have occasion to use the diamond as a tool for cutting glass for photographic or other purposes. The diamond used for this purpose is, as I have said before, generally of the spheroid variety, as being the hardest, and is used in its natural state. Polished diamonds are useless; they will scratch, but not produce a clean cut; and so with all other gems or crystals. The only hard diamonds used by glaziers are the plow and the swivel; the latter is that usually employed; it is, I believe, more costly than the former, but far easier of application. The form of the swivel diamond is so well known as to need no illustration. Its parts consist of the shank or handle (sometimes called the stick), the ferrule, and the steel swivel upon which the diamond is set, and which turns to enable the workman to lay the diamond rightly. The great secret of being able to cut with a diamond lies in observing the angle at which the bottom of the swivel inclines, and keeping this, when cutting, perfectly parallel with the face of the glass to be cut. The angular form of the facets of the diamond varies greatly, and must therefore influence the slope at which it can cut; the bottom of the swivel is sloped accordingly, and acts as a guide. A good diamond, well used, will cut so thoroughly through a piece of glass that it will fall in two without pressure from the hands. The cause of the fracture of the glass at times not following the cut made by the diamond, and so spoiling the work, is from the workman not keeping the diamond at an equal slope from beginning to end of the cut; and also may be caused by unequal pressure. It is found that the diamonds used by some cannot be used by others. The bones of the shoulder, the elbow, and wrist are not set alike in all men, and have something to do with this, also their particular habits of motion, arising in great measure from their different callings; but I believe, by practice, any good diamond can be used by any one; but it is better to purchase such an one as suits the usual habits of the hand of the purchaser, and never to permit its use by any one else, or it will soon need resetting, and perhaps become worthless, as all diamonds have not got more than one cutting facet.

I have heard many complaints about deception being practised by dealers in glaziers' diamonds, but do not think that any respectable house would be guilty of it. Before purchasing, the diamond should be examined with a strong magnifying lens, to see that it has not been chipped or split by a fall. The setting should be looked to. It should then be tried on a piece of glass, and the cuts made examined, to see that it cuts deep and clean without scratching. If (say) half a dozen clean deep cuts, the glass afterwards separating readily, can be made with a diamond right off, I do not think its suitability and usefulness need be feared. Diamonds are sometimes set in the handles of pocket knives, and are very portable and convenient for amateurs. Diamonds are set of different sizes, according to the thickness of glass to be cut. Thus the plate glass or flush diamond is of large size, while the one used for cutting thin microscopic glass is small. There are also what are termed circular diamonds, and diamonds cutting upon movable circular tables, used for cutting glasses for magic lantern slides, clocks, &c. Ovals are also cut generally by shapes applied upon the glass, but are sometimes executed by machinery.

TWO SIMPLE AND PRACTICAL METHODS OF PRINTING UPON IVORY.

BY DAVID DUNCAN

IVORY is difficult to manipulate for photographic purposes, and success has been rare except in the hands of a few skilful votaries of the art. Having succeeded with the follow-

* Continued from p. 292.

ing, I add my mite to photographic lore. Professional secrecy I regard as wrong. "There is that scattereth, and yet increaseth." One grain of wheat may produce sheaves, and thousands of shot may be got from a lump of lead.

COLLODIO-CHLORIDE PROCESS.—Very much depends upon the ivory having a smooth or polished surface. There are various methods of obtaining this. A nice surface can be obtained by rubbing the ivory with a piece of wash-leather, occasionally dipped in putty powder. When polished, immerse the ivory in a thin solution of spirit varnish, and dry gently over a gas stove or before the fire. Any kind of varnish will do that is white and clear. Then prepare the following:—

French gelatine ...	...	1 drachm
Water ...	...	1 ounce
Loaf sugar ...	...	$\frac{1}{2}$ drachm.

Coat one side of the varnished ivory (the polished side) by pouring collodion fashion, or with a camel-hair brush. The gelatine solution should be strained through fine muslin, or filtered through cotton wool, until very clear. When dry, coat with collodio-chloride of silver in the dark room; dry, and print deep; wash, either under the tap or in a flat dish. Any old toning bath will do to tone the picture. Fix in a weak solution of hypo; say,—

Hyposulphite of soda ...	...	2 $\frac{1}{2}$ ounces
Water ...	...	20 "

Very beautiful pictures can be obtained by the above.

PHOTO-DIAPHANIE PROCESS.—The following is interesting, and the results are beautiful, but it is difficult to manage. Procure albuminized transfer paper—that made expressly for photo-diaphanie; float five minutes on—

Nitrate of silver . . .	...	120 grains
Water ...	...	1 ounce.

Print in the sun, if possible, and until the high lights are well covered. The right amount of printing required can only be judged by experience. Wash, and tone in—

Distilled water ...	...	10 ounces
Pure chloride of gold ...	...	15 grains.

It will take some time to tone. When toned, wash, and immerse the picture in a saturated solution of hyposulphite of soda for five minutes. Now wash in several changes of water until the albumen film upon which the picture is printed loosens itself from the paper. When detached, the film floats on top of the water as a delicate transparency. The polished ivory is now brought under the film in the water, and gently arranged by the fingers. The picture, after coming from the water, is placed between smooth note-paper, inserted in a book, and left until dry.

ON THE MEASUREMENT OF THE LUMINOUS INTENSITY OF LIGHT.

BY WILLIAM CROOKES, F.R.S., ETC.

THE measurement of the intensity of a ray of light is a problem the solution of which has been repeatedly attempted, but with less satisfactory results than the endeavours to measure the other radiant forces. The problem is susceptible of two divisions—the absolute and the relative measurement of light.

1. Given a luminous beam, we may require to express its intensity by some absolute term having reference to a standard obtained at some previous time, and capable of being reproduced with accuracy at any time in any part of the globe. Possibly two such standards would be necessary, differing greatly in value, so that the space between them might be subdivided into a definite number of equal parts; or the same result might, perhaps, be obtained by the well-known device of varying the apparent intensity of the standard light by increasing and diminishing its distance from the instrument.

2. The standard of comparison, instead of being obtained once for all, like the zero- and boiling-points of a thermometer, may be compared separately at each observation; and the problem then becomes somewhat simplified into the determination of the relative intensities of two sources of light.

The *absolute* method is, of course, the most desirable; but as the preliminary researches and discoveries are yet to be made, before a photometer, analogous to a thermometer in fixity of standard and facility of observation, could be devised, the realisation of an absolute light-measuring method appears somewhat distant. The path to be pursued towards the attainment of this desirable object appears to be indicated in the observations which from time to time have been made by Becquerel, Herschel, Hunt, and others, on the chemical action of the solar rays, and the production thereby of a galvanic current, capable of measurement on a delicate galvanometer, by appropriate arrangements of metallic plates and chemical baths connected with the ends of the galvanometer wires.

Many so-called photometers have been devised by which the chemical action of the rays at the most refrangible end of the spectrum have been measured, and the chemical intensity of light tabulated by appropriate methods; and within the last few years Professors Bunsen and Roscoe have contrived a perfect chemical photometer, based upon the action of the chemical rays of light on a gaseous mixture of chlorine and hydrogen, causing them to combine with formation of hydrochloric acid.

But the measurement of the chemical action of a beam of light is as distinct from photometry proper, as is the thermometric registration of the heat rays constituting the other end of the spectrum. What we want is a method of measuring the intensity of those rays which are situated at the intermediate parts of the spectrum, and produce in the eye the sensation of light and colour; and, as previously suggested, there is a reasonable presumption that further researches may place us in possession of a photometric method based upon the chemical action of the *luminous* rays of light.

The rays which effect an ordinary photographic sensitive surface are so constantly spoken of and thought about as the ultra-violet invisible rays, that it is apt to be forgotten that some of the highly luminous rays of light are capable of exerting chemical action. Fifteen years ago* the writer was engaged in some investigations on the chemical action of light, and he succeeded in producing all the ordinary phenomena of photography, even to the production of good photographs in the camera, by purely luminous rays of light, free from any admixture with the violet and invisible rays. When the solar spectrum, of sufficient purity to show the principal fixed lines, is projected for a few seconds on to a sensitive film of iodide of silver, and the latent image then developed, the action is seen to extend from about the fixed line G to a considerable distance into the ultra-violet invisible rays. When the same experiment was repeated with a sensitive surface of bromide of silver instead of iodide of silver, the result of the development of the latent image showed that in this case the action commenced at about the fixed line b, and extended, as in the case of the iodide of silver, far beyond the violet. A transparent cell, with parallel glass sides, one inch across, was filled with a solution of 25 parts of sulphate of quinine to 100 parts of dilute sulphuric acid; this was placed across the path of the rays of light, and photographs of the spectrum were again taken on iodide of silver and on bromide of silver, the arrangements in all cases being identical with those in the first cited experiments, with the exception of the interposition of the quinine screen. The action of the sulphate of quinine upon a ray of light is peculiar; to the eye it scarcely appears to have any action at all, but it is absolutely opaque to the ultra-violet, so-called chemical rays, and thus limits the photographic action on the bromide and iodide of silver to the purely luminous rays. On developing the latent images it was now found that the action on iodide of silver was confined to a very narrow line of rays, close to the fixed line G, and in the case of bromide of silver to the space between b and G. Designating the spaces of action by colours instead of fixed lines, it was thus proved that, behind a screen of sulphate of quinine, iodide of silver was affected only by the luminous rays about the centre of the indigo portion of the spectrum, whilst bromide of silver was affected by the green, blue, and some of the indigo rays.

It is very likely that a continuance of these experiments would lead to the construction of a photometer capable of measuring the luminous rays; for although bromide of silver behind quinine is not affected by the red or yellow rays, still it is by the green and blue; and as the proportion of red, yellow, green, and blue rays is always invariable in white light (or the light would not be white, but coloured), a method of measuring

* The Journal of the Photographic Society, vol. 1.

the intensity of one set of the components of white light would give all the information we want; just as in an analysis of a definite chemical compound, the chemist is satisfied with an estimation of one or two constituents only, and calculates the others.

Method based upon the foregoing considerations would supply us with what may be termed an *absolute* photometer, the indication of which would be always the same for the same amount of illumination, requiring no standard light for comparison; and pending the development of experiments which the writer is prosecuting in this direction, he has been led to devise a new, and, as he believes, a valuable form of *relative* photometer.

A relative photometer is one in which the observer has only to determine the relative illuminating powers of two sources of light, one of which is kept as uniform as possible, the other being the light whose intensity is to be determined. It is therefore evident that the great thing to be aimed at is an absolutely uniform source of light. In the ordinary process of photometry the standard used is a candle, defined by Act of Parliament as a "sperm candle of six to the pound, burning at the rate of 120 grains per hour." This is the standard from which estimates of the value of illuminating gas are deduced, hence the terms "12-candle gas," "14-candle gas," &c. In his work on "Gas Manipulation," Mr. Sugg gives a very good account of the difficulties which stand in the way of obtaining uniform results with the Act of Parliament candle. A true sperm candle is made from a mixture of refined sperm with a small proportion of wax, to give it a certain toughness, the pure sperm itself being extremely brittle. The wick is of the best cotton, made up into three cords and plaited. The number of strands in each of the three cords composing the wick of a six-to-the-pound candle is seventeen, although Mr. Sugg says there does not appear to be any fixed rule, some candles having more and others less, according to the quality of the sperm. Sperm candles are made to burn at the rate of one inch per hour, and the cup should be clean, smooth, and dry. The wick should be curved slightly at the top, the red tip just showing through the flame, and consuming away without requiring snuffing. To obtain these results the tightness of the plaiting and size of the wick require careful attention; and as the quality of the sperm differs in richness or hardness, so must the plaiting and number of strands. A variety of modifying circumstances thus tend to affect the illuminating power of a standard sperm candle. These difficulties, however, are small, compared with those which have resulted from the substitution of paraffine, &c., for part of the sperm; and Mr. Sugg points out that candles can be made with such combinations of stearine, wax, or sperm, and paraffine as to possess all the characteristics of sperm candles, and yet be superior to them in illuminating power; while, on the other hand, candles made from the same materials otherwise combined are inferior. When, in addition to this, it is found that candles containing paraffine require wicks more tightly plaited and with fewer strands than those suitable for the true sperm candle, our readers will be enabled to judge of the almost unsurmountable difficulties which beset the present system of photometry.

But assuming that the true parliamentary sperm candle is obtained, made from the proper materials, and burning at the specified rate, its illuminating power will be found to vary with the temperature of the place where it has been kept, the time which has elapsed since it was made, and the temperature of the room wherein the experiment is tried.

The Rev. W. R. Bowditch, in his work on "The Analysis, Purification, &c., of Coal Gas," enters at some length into the question of test-candles, and emphatically condemns them as light measures; one experiment quoted by this author showed that the same gas was reported to be 14.63 or 17.36 candle gas, according to the way the experiment was conducted.

The present writer has taken some pains to devise a source of light which should be at the same time fairly uniform in its results, would not vary by keeping, and would be capable of accurate imitation at any time and in any part of the world by mere description. The absence of these conditions seems to be one of the greatest objections to the sperm candle. It would be impossible for an observer on the continent, ten or twenty years hence, from a written description of the sperm candle now employed, to make a standard which would bring his photometric results into relation with those obtained here. Without presuming to say positively that he has satisfactorily solved all difficulties, the writer believes that he has advanced some dis-

tance in the right direction, and pointed out the road to further improvement.

Before deciding upon a standard light, experiments were made to ascertain whether the electric current could be made available. Through a coil of platinum wire, so as to render it brightly incandescent, a powerful galvanic current was passed; and its strength was kept as constant as possible by a thick wire galvanometer and rheostat. To prevent the cooling action of air-currents the incandescent coil was surrounded with glass; and it was hoped that by employing the same kind of battery and by varying the resistance so as to keep the galvanometer needle at the same deflection, uniform results could be obtained. In practice, however, it was found that many things interfered with the uniformity of the results, and the light being much feebler than it was advisable to work with, this plan was deemed not sufficiently promising, and it was abandoned. The method ultimately decided upon is the following:—Alcohol of sp. gr. 0.805, and pure benzole boiling at 81° C., are mixed together in the proportion of 5 volumes of the former and 1 of the latter. This burning fluid can be accurately imitated from description at any future time and in any country, and if a lamp could be devised equally simple and invariable, the light which it would yield would, it is presumed, be invariable. This difficulty the writer has attempted to overcome in the following manner.

A glass lamp is taken of about 2 ounces capacity, the aperture in the neck being 0.25 inch diameter; another aperture at the side allows the liquid fuel to be introduced, and by a well-known laboratory device the level of the fluid in the lamp can be kept uniform. The wick-holder consists of a platinum tube 1.81 inches long and 0.125 inch internal diameter. The bottom of this is closed with a flat plug of platinum, apertures being left in the sides to allow free access of spirit. A small platinum cup, .5 inch diameter and .1 inch deep, is soldered round the outside of the tube 0.5 inch from the top, answering the three-fold purpose of keeping the wick-holder at a proper height in the lamp, preventing evaporation of the liquid and keeping out dust. The wick consists of 52 pieces of hard-drawn platinum wire, each 0.01 inch in diameter and 2 inches long, perfectly straight and tightly pushed down into the platinum holder until only 0.1 inch projects above the tube. The height of the burning fluid in the lamp must be sufficient to cover the bottom of the wick-holder; it answers best to keep it always at the uniform distance of 1.75 inches from the top of the platinum wick; a slight variation of level, however, has not been found to influence the light to an extent appreciable by our present means of photometry. The lamp having the reservoir of spirit thus arranged, the platinum wires parallel and their projecting ends level, a light is applied, and the flame instantly appears, forming a perfectly-shaped cone 1.25 inches in height, the point rate of maximum brilliancy being 0.56 inch from the top of the wick. The extremity of the flame is perfectly sharp, without any tendency to smoke; without flicker or movement of any kind, it burns, when protected from currents of air, at a uniform rate of 136 grains of liquid per hour. The temperature should be about 60° F., although moderate variations on either side exert no perceptible influence. Bearing in mind Dr. Frankland's observations on the direct increase in the light of a candle with the atmospheric pressure, accurate observations ought only to be taken at one height of the barometer. To avoid the inconvenience and delay which this would occasion, a table of corrections should be constructed for each 0.1 inch variation of barometric pressure.

There is no doubt that this flame is very much more uniform than that of the sperm candle sold for photometric purposes. Tested against a candle, considerable variations in relative illuminating power have been observed; but on placing two of these lamps in opposition no such variations have been detected. The same candle has been used, and the experiments have been repeated at wide intervals, using all usual precautions to ensure uniformity. The results are thus shown to be due to variations in the candle and not in the lamp.

It is expected that whoever may be inclined to adopt the kind of lamp here suggested will find not only that its uniformity may be relied upon, but that, by following accurately the description and dimensions here laid down, each observer will possess a lamp of equivalent and convertible photometric value, so that results may not only be strictly comparable between themselves, but within slight limits of accuracy comparable with those obtained by other experimentalists. The dimensions of wick, &c., here laid down are not intended to fix the standard. Persons engaged in photometry as an important branch of their

regular occupation will be better able to fix these data than the writer, by whom photometry is only occasionally pursued as a means of scientific research. Already many improvements suggest themselves, and several causes of variation in the light have been noticed. Future experiments may point out how these sources of error are to be overcome; but at present there is no necessity to refine our source of standard light to a greater degree of accuracy than the photometric instrument admits of.

The instrument for measuring the relative intensities of the standard and other lights next demands attention. The contrivances in ordinary use are well known. Most of them depend on a well-known law in optics; namely, that the amount of light which falls upon a given surface varies inversely as the square of the distance between the source of light and the object illuminated. The simplest observation which can be taken is made by placing two sources of light (say a candle and gas-lamp) opposite a white screen, a few feet off, and placing a stick in front of them, so that two shadows of the stick may fall on the screen. The strongest light will cast the strongest shadow; and by moving this light away from the stick, keeping the shadows side by side, a position will at last be found at which the two shadows appear of equal strength. By measuring the distance of each light from the screen, and squaring it, the product will give the relative intensities of the two sources of light.

In practice, this plan is not sufficiently accurate to be used except for the roughest approximations; and from time to time several ingenious contrivances, all founded upon the same law, have been introduced by scientific men, by which a much greater accuracy is obtained; thus in Ritchie's photometer the lights are reflected on to a piece of oiled paper in a box, and their distances are varied until the two halves of the paper are equally illuminated. In Bunsen's photometer, which is the one now generally used, the lights shine on opposite sides of a disc of white paper, part of which has been smeared with melted spermaceti to make it more transparent. When illuminated by a front light, the greased portion of the paper will look dark; but if the observer goes to the other side of the paper, the greased part looks the lighter. If, therefore, lights of unequal intensity are placed on opposite sides of a piece of paper so prepared, a difference will be observed; but by moving one backwards or forwards, so as to equalize the intensity, the whole surface of the paper will appear uniformly illuminated on both sides. This photometer has been modified by many observers. By some the disc of paper is moved, the lights remaining stationary; by others the whole is enclosed in a box, and various contrivances are adopted to increase the sensitiveness of the eye and to facilitate calculation; but in all these the sensitiveness is not greatly augmented, as the eye cannot judge of very minute differences of illumination approximating to equality.

In 1833, Arago described a photometer in which the phenomena of polarized light were employed. This instrument is fully described, with drawings, in the tenth volume of the *Œuvres Complètes de François Arago*; but the description, although voluminous, is far from clear. The principle of its construction is founded on "the law of the square of the cosines," according to which polarized rays pass from the ordinary to the extraordinary image. The knowledge of this law, he says, will not only prove theoretically important, but will further lead to the solution of a great number of very important astronomical questions. Suppose, for example, that it is wished to compare the luminous intensity of that portion of the moon directly illuminated by the solar rays with that of the part which receives only light reflected from the earth, called the *partie cendrée*. Were the law in question known, the way to proceed would be as follows:—After having polarized the moon's light, pass it through a doubly refracting crystal, so disposed that the rays, not being able to bifurcate, may entirely undergo ordinary refraction. A lens placed behind this crystal will therefore show but one image of our satellite; but as the crystal in rotating on its axis passes from its original position, the second image will appear, and its intensity will go on augmenting. The movement of the crystal must be arrested at the moment when, in this growing extraordinary image, the segment corresponding to the part of the moon illuminated by the sun exhibits the intensity of the ashy part shown by the ordinary image. From these data it is easy to perceive, he says, that the problem is capable of solution.

In another part of the same volume, after speaking of the polariscope which goes by his name, Arago writes:—"I have

new arrived at the general principle upon which my photometric method is entirely founded. The quantity (I do not say the proportion)—the quantity of completely polarized light, which forms part of a beam partially polarized by reflection, and the quantity of light polarized rectangularly, which is contained in the beam transmitted under the same angle, are exactly equal to each other. The reflected beam and the beam transmitted under the same angle by a sheet of parallel glass have in general very dissimilar intensities; if, however, we examine with a doubly refracting crystal, first the reflected and then the transmitted beam, the greatest difference of intensity between the ordinary and the extraordinary images will be the same in the two cases, because this difference is precisely equal to the quantity of polarized light which is mixed with the common light."

In Arago's astronomy, the author again describes his photometer in the following words: "I have constructed an apparatus by means of which, upon operating with the polarized image of a star, we can succeed in attenuating its intensity by degrees exactly calculable after a law which I have demonstrated." It is difficult to obtain an exact idea of this instrument from the description given; but from the drawings it would appear to be exceedingly complicated, and to be different in principle and construction from the one now about to be described. The present photometer has this in common with that of Arago, as well as with those described in 1853 by Bernard,* and in 1854 by Babinet,† that the phenomena of polarized light are used for effecting the desired end. But it is believed that the present arrangement is quite new, and it certainly appears to answer the purpose in a way which leaves little to be desired. The instrument will be better understood if the principles on which it is based are first described.

Fig. 1 shows a plan of the arrangement of parts, not drawn to scale, and only to be regarded as an outline sketch to assist in the comprehension of general principles. Let D represent a source of light. This may be a white disc of porcelain or paper illuminated by any artificial or natural light. C represents a similar white disc, likewise illuminated. It is required to compare the photometric intensities of D and C. (It is necessary that neither D nor C should contain any polarized light, but that the light coming from them, represented on each disc by the two lines at right angles to each other, forming a cross, should be entirely unpolarized.) Let H represent a double refracting achromatic prism of Iceland spar; this will resolve the disc D into two discs, *d* and *d'*, polarized in opposite directions; the plane of *d* being, we will assume, vertical, and that of *d'* horizontal. The prism H will likewise give two images of the disc C; the image *c* being polarized horizontally, and *c'* vertically. The size of the discs D C, and the separating power of the prism H are to be so arranged that the vertically polarized image *d*, and the horizontally polarized image *c*, exactly overlap each other, forming, as shown in the figure, one compound disc *c d*, built up of half the light from D and half that from C.

(To be continued.)

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The second out-door meeting was held on Monday, the 22nd ult., at Llangollen, North Wales. Notwithstanding that the morning opened rather unfavourably, between twenty and thirty

* *Comptes Rendus*, April 25, 1853.

† Proceedings of the British Association, Liverpool Meeting, 1854.

ladies and gentlemen assembled, and passed a very pleasant day. Several of the party elected to continue their journey a few miles past Llangollen; the rest, who were content with the town and its picturesque vicinity, were able to secure several pictures before the rain came, just as the "onward" party were getting to work. The rain continued steadily for about two hours, after which, until dinner time, Sol was in the ascendant, and cameras in full occupation.

At four o'clock both detachments met, and, at the President's kind invitation, sat down to a sumptuous repast at the "Hand" Hotel. Owing to a misunderstanding with regard to the time of departure of the return train, the party was compelled to wait for the next one, about half past eight; and to relieve the tedium of the "long wait"—everybody else's plates being exposed and cameras packed up—Mr. Mawdsley took two groups in the court-yard of the "Hand," upon collodio-bromide plates. The return journey was by far the least pleasant part of the day's proceedings; as, with the total disregard of punctuality generally observable on that line, the train arrived at Birkenhead a few minutes before midnight, and passengers were landed at Liverpool too late for all out-going trains and omnibuses, and cabs at extra fares were in great demand.

THE ordinary monthly meeting of the same Association was held on Tuesday evening, the 30th ult., the President, the Rev. G. J. BANNER, in the chair.

The minutes of the previous meeting were read and confirmed, and Mr. Alfred Tyrer was elected a member of the Association.

A vote of thanks was passed by acclamation to the President for his hospitality on the occasion of the excursion to Llangollen.

After some desultory conversation,

The President asked Mr. Henderson if he could explain the cause of the peculiar tones noticeable in some of his prints on the table.

Mr. HENDERSON attributed them to the paper, while the opinions of others leaned towards acidity in the printing or toning baths.

Mr. HUGHES exhibited some prints mounted with india-rubber, and which were peeling off the mounts, and gave it as his opinion that "india-rubber mounting" is a "delusion and a snare."

Mr. GUYTON made some remarks bearing out Mr. Hughes's opinion, and stated that he had been warned of the effect years ago.

It was decided to hold the third out-door meeting at Beeston, on Thursday, 9th July.

The meeting was adjourned at an early hour, the attendance of members being very small.

THE usual monthly meeting of the Association was held on the evening of Tuesday, the 28th July, at the Free Public Library, the President, the Rev. G. T. BANNER, in the chair.

The minutes of the previous meeting and of the Llangollen excursion were read and confirmed.

Mr. MAWDSLEY submitted for inspection some 8½ by 6½ prints from negatives on the Liverpool Company's plates, which were much admired. They consisted of views on the Sussex coast; and two were presented to the Society's album.

Mr. GUYTON brought forward some first-class views, &c., including "The Prize of Prizes," by Dr. Hemphill; in emulation of which Dr. Watling showed an admirable print from a wet collodion negative, both subjects consisting of studies of "Still Life."

Many members being inadvertently prevented from competing for Mr. Green's prize, the time was extended, and the large print will be awarded at the August meeting for the best twelve stereos taken during June, July, and August.

Mr. GREENE also offered one of his 24 by 18 prints "for the best year's work" shown at the end of the year.

The thanks of the Association were unanimously awarded to Mr. Greene for his generosity.

On the motion of Mr. HENDERSON, seconded by Mr. HUBBACH, it was decided to have an excursion to the "Old Hut" on Saturday afternoon, the 15th of August.

A paper by Mr. BOLTON, on "A New Preservative Medium," was then read, and a vote of thanks was passed to the author.

Mr. BOLTON, however, and his results being absent, it was

considered that further experiments were necessary to establish the superior claims of quassia over tannin.

Mr. GREENE related his experience with a new toning bath recently described in the PHOTOGRAPHIC NEWS by Mr. Bovey, who finds that the ordinary adjuncts to chloride of gold in the toning bath, while acting as retarders, have a tendency to precipitate the gold as powder. He proposed:—

Chloride of gold (orange)	...	...	8 grains
Common salt	...	...	1 grain

Pour on 1½ pints boiling water, and let stand till lukewarm and then add 2 gallons cold water. It improves by keeping only requiring to be strengthened. In rather more than the above quantity Mr. Greene recently toned simultaneously forty-four prints 10 by 12 inches, and one print 24 by 18, obtaining rich sepia and black tones, with an available surplus of gold.

Mr. WILSON considered the action somewhat similar to that of the double chloride of gold and sodium.

The President showed some prints toned and fixed at one operation, as lately recommended by Dr. Liesegang, but the results were unsatisfactory.

A short discussion ensued, and the meeting then adjourned.

Correspondence.

REMOVING SILVER STAINS FROM OPAL GLASS.

SIR.—I see that one of your correspondents has met with a difficulty in removing the image from opal plates. There is no need for him to get a fresh sample, it this be the only thing wrong. After removing the film, should the impression remain, let him subject the plate to a strong heat from a spirit-lamp, having previously covered it with much diluted nitric acid. The ghost of the picture will slowly vanish, and the plate be as good as ever.—Your obedient servant, P. S. DRAYTON.

Horton Court, Chipping Sodbury, 27th July, 1868.

PS—I do not know if this plan will answer with collodio-chloride or collodio-bromide plates, but it has never failed with the ordinary wet plates.

WASHING MACHINES.

DEAR SIR,—I can fully endorse Mr. Cherrill's remarks upon washing machines. The most efficient one—and which I have had in use many years—may be found fully described, as used by the Government at Southampton, in one of the early numbers of the PHOTOGRAPHIC NEWS. Not only small but whole sheets can be thoroughly washed without tearing, and it may readily be made by any country carpenter.—I am, dear sir, yours truly, AN OLD PHOTOGRAPHER.

July 25th, 1868.

Talk in the Studio.

FINAL MEDALS OF THE FRENCH EXHIBITION.—Our readers will be gratified to learn that Dr. Diamond has just received from the French Imperial Commission a medal "for services rendered," in acknowledgment of his labours as a juror in the photographic department of the Exhibition of last year. This is the more complimentary to the recipient of the medal, and will be the more gratifying to English photographers, inasmuch as it is a somewhat exceptional honour, not conferred upon the jurors generally, but only upon such as have been especially marked out for honour for the especial value of their assistance.

RETOUCHING NEGATIVES.—We have been favoured by Mr. J. B. Mohr with a sight of some touched negatives, and prints therefrom, which aptly illustrate the value of the method in giving refinement without detracting in any degree from the likeness. Portraitists are becoming more and more familiar with the fact that the truth of photography may be materially aided by the truth of art, and that yellow freckles, &c., scarcely perceptible in nature, are not truthfully rendered when represented by coarse, black spots. Skillful retouching of the negative removes all this, and makes the photograph come nearer to the truth of nature. Our readers may learn, on reference to our advertising columns, that Mr. Mohr is for a short time de-

voting himself to teaching photographers his method of touching, which will be a boon to many. We note that in the advertisement Mr. Mohr is to be addressed as "N.," at the office of this paper.

SILVERING IRON WIRE.—A patent has been granted in Bavaria for the following method of silvering hooks and eyes and other small articles made of iron wire. The articles are suspended in dilute sulphuric acid until the iron shows a clean, bright surface. After rinsing in pure water, they are placed in a bath of a mixed solution of sulphate of zinc, sulphate of copper, and cyanide of potassium, and here remain until they receive a bright coating of brass. Lastly, they are transferred to a bath of nitrate of silver, cyanide of potassium, and sulphate of soda, in which they quickly receive a coating of silver.

DECOMPOSITION AND RECOMPOSITION OF LIGHT.—Mr. W. J. Lane used, in place of the costly apparatus generally employed for this beautiful and instructive experiment, a glass tube 8 or 10 inches long and $\frac{1}{2}$ an inch in diameter, with a bore of .05 to .09 of an inch. In a room containing only one light (a gas flame, for instance), while standing a few feet from and facing it, place the tube horizontally across the eyes and as near to them as possible, and on looking toward the light a beautiful arc of a large size will appear, which is composed of a series of splendid spectra, more or less brilliant, according to the refractive powers of the tube and the distance of the observer from the light. Now, upon revolving the tube while so placed, the arc of light will apparently revolve very rapidly, the colours will be bleuded, and white light produced, thus affording a pleasing experiment. With large tubes of greater dispersive power the effect would probably be more beautiful.

To Correspondents.

BILL JENKINS.—In strengthening a negative bath you can add the necessary proportion of nitrate of silver direct to the bath, or you can add a little of a fresh strong solution; but the mode of proceeding which we prefer, and which we find answers best, is first to add a few ounces of distilled water to the old bath, which will cause a precipitate of iodide of silver, and then, after filtering, add sufficient nitrate of silver to make the whole of the desired strength.

LYTTE'S STUDIO.—The defect in the print you forward arises from imperfect fixation. The solution of hyposulphite has been too weak or exhausted, or the print has not been immersed for a sufficient time. No such result will ever arise if you fix in fresh strong hypo, immersing the prints for a period of not less than ten or fifteen minutes, and keeping them in motion, by turning over from time to time, to prevent them sticking to each other.

D. WELCH.—Thanks. The specimens are very good and interesting, and, as you observe, attest the value of the various formulae you mention. It is satisfactory to us to know that the formulae we have published give such good results.

W. J. A. G.—If you wash the negative after development, and then cover it with a mixture of equal parts of golden syrup and water, you can intensify and fix at your leisure without any disadvantage. Before proceeding to intensify, take care to remove all the golden syrup solution, as if any portion remain on or in the film it will act somewhat like acetic acid, having a restraining action. There are several good reasons why it is better to fix at home. It enables you to judge of the intensity of the picture deliberately, without the inconvenience of limited space, limited amount of water, &c.; and, further, it dispenses with the necessity of carrying any fixing agents amongst your other chemicals, or the danger of splashing the fixing solution into the bath, a danger which working in little space sometimes renders imminent.

J. R. G.—If you neutralize and sun thoroughly the negative bath with which you have accidentally mixed a little of the printing bath containing sugar and nitrate of soda, it is probable that any injurious matter which may be present will be eliminated; or it may be done without sunning by means of permanganate of potash. The only injurious matter will be the sugar and any traces of albumen. The nitrate of soda will be harmless in the negative bath. This course will be better than boiling down the solution in order to use it as a printing bath, because it is difficult to eliminate all iodide of silver, and that is sometimes found to interfere with toning operations; but if you prefer the latter, first add double the bulk of distilled water to the bath to throw down iodide, filter, and then boil down to the proper strength.

A. W.—During the period in which the Daguerreotype process was used, bromine itself, and not its salts, was employed. A mixture of bromine and iodine, called bromide of iodine, was at that time used, and in 1846 Mr. Bingham introduced what was called "bromide of lime," a mixture of bromine and lime, somewhat similar in character to chloride of lime. In the paper processes bromide of potassium was employed, and as this was freely soluble in water no other salt was needed. It was not until after the introduction of the collo-

dion process that a new bromide salt became desirable, bromide of potassium being very slightly soluble in collodion. In 1853 we find record of the bromides of iron, nickel, cadmium, and ammonium having been tried: some by the Abbe Laborde, and some by Mr. Crookes. The latter gentleman had, we believe, used some of them earlier than that; but we cannot state at what date.

A SUBSCRIBER.—As your letter contains grave charges, which might be made the subject of legal enquiry, they should be substantiated by your name, which we shall be glad to receive. The case is not at an end, we believe, and facts like those you mention bear seriously upon it, and should be brought forward and substantiated.

II. II.—Your idea of the shape of the glass room in question is correct. You will find the dimensions in our description of it. 2. Generally, photographs intended for finishing in crayons are produced on rough drawing-paper, which presents sufficient tooth without further preparation. Sometimes the surface is treated with size in which a little powdered pumice or cuttle-fish bone is mixed, so as to secure a tooth. As a rule, soft crayons are preferred; but much depends on the choice of the colourist. For finishing in black and white, a few sharp touches with *conté* crayon are often employed.

J. H. JOHNSON.—If the nitrate of soda were quite pure it should cause no precipitate at all when added to a silver solution. The turbidity has probably been due to the presence of some slight impurity. 2. It is probable that you will find that the strong solution will be useful to add to your regular solution from time to time to strengthen and replenish it. Add a little sugar; but the nitrate of soda will scarcely be necessary, as the bath is robbed of the latter in less proportion than it is of silver.

COLLODION.—The term "equivalent focus" always applies to compound lenses, and means the focus at which it will give an image the same size as a single lens of the same power. For instance, if a single lens give, in rendering an object twenty feet distant, an image six inches in length, a portrait lens of similar equivalent focus will give exactly the same sized image of the same object at the same distance. But measuring from the back of each lens to the ground glass the distance will be slightly different. The single lens has (say) a focus of six inches measured from its back surface to the ground glass; but the portrait lens will probably only have about five inches between its back surface and the ground glass; to get the equivalent focus, the measurement must be from the ground glass to a point between the front and back lenses of the combination. The simplest mode of ascertaining the equivalent focus is to take an engraving or map, and produce a sharp image on the ground glass precisely the same size as the original, then unscrew the lens, and measure the distance between the object and the ground glass: one-fourth of that distance is the equivalent focus of the lens. 2. Chloride of calcium and chloride of lime are two different things. The former is a combination of chlorine and the metal calcium, the latter is an incorrect term used to describe a mechanical mixture formed by passing chlorine through the hydrate of lime; it is supposed to consist of chlorine, hypochlorite of lime, and hydrate of lime. 3. We do not know whether Harmer's collodion will or will not be introduced into this country. 4. Coffee plates carefully prepared are said to keep some months. How the recent hot weather would affect their keeping qualities we cannot say. The dryness would be favourable to keeping. 5. Either the D. or the new rapid, we should think. The optician will give you the best advice.

II. S.—The marks on the negative appear like those produced by over-iodized collodion, for which the best remedy is a little more plain collodion, or the addition of a little more soluble cotton and a little stronger bath. Age will mend the matter; the addition of about half a grain of bromide per ounce, and the use of a stronger bath, may help you. We have not had time yet to examine your collodions, but will take an early opportunity of doing so.

R. M. F.—We prefer sugar-candy for the developer, but ordinary sugar may be used; molasses restrains too much. In some experiments we made, 1 grain of molasses was equivalent to 20 of glacial acetic acid in restraining power.

G. C. C. quotes the following from the *Engineer*:—"Cyanide of potassium, much used by photographers, is an exceedingly dangerous poison; and they will be glad to hear that the painful ulcers and bad symptoms which it produces may be effectually prevented by rubbing the hands, when soiled with it, with a mixture of protosulphate of iron reduced to a very fine powder, and linseed oil." He adds:—"I never heard of the hands being 'soiled' with cyanide of potassium. I do not quite understand the meaning of the paragraph, unless it is that the use of the sulphate of iron, &c., should follow the cleansing of the hands from the stains of nitrate of silver with cyanide of potassium." G. C. C. should remember that the word "soiled" is used doubtless in the sense which Lord Palmerston regarded dirt, as simply "matter in the wrong place." He is right in his idea that the iron salt should follow the cyanide in order to neutralize it; a thorough good rinsing with water should follow both; but we counsel our reader to avoid cyanide, and use simply pumice-stone and water.

J. MARTIN.—Received. Thanks.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 518.—August 7, 1868.

CONTENTS.

	PAGE		PAGE
New Substitute for Ground Glass	373	Notes on Development.....	369
The Military School of Photography at Chatham	373	On Nitroglucose. By M. Carey Lea.....	381
Echoes of the Month. By an Old Photographer.....	374	Correspondence—Photographic Notes on the Continent—	
Short Essays on Photography and Art. By Nelson K.		Informers and Piracy: Graves v. Mercer—Photography	
Cherrill	376	and Disease	381
The Late M. Claudet	377	Talk in the Studio.....	383
Pictorial Effect in Photography. By H. P. Robinson.....	378	To Correspondents	384
On the Principles of Lighting and Constructing Studios. By Dr.		Registration of Photographs	384
Vogel.....	379		

NEW SUBSTITUTE FOR GROUND GLASS.

A VARIETY of substances have been proposed, and some of them successfully used, as substitutes for ground glass as used in photography, either for focussing-screens or as a backing for transparencies for the stereoscope. Our attention has been recently called by Mr. Woodbury to another, which is, we think, better than any that has been proposed or tried. The material proposed is not, indeed, new, but its application for the purpose in question is, we believe, new, as well as efficient.

Mr. Woodbury proposes to use gelatine rendered semi-opaque by the addition of a white pigment. This may be either applied direct to the front or back of the transparency, or it may be made in thin sheets and used as required. For stereoscopic transparencies this appears to us, from the examples we have seen, to give a better result than either ground glass, opal glass, or dull varnish. The ground glass, unless it be very fine indeed, when used with stereoscopes with powerful lenses, gives an unpleasantly sparkling or frosted appearance, and interferes with the delicate definition of the picture; and this is true, but perhaps in a less degree, of the dull varnishes. Opal glass generally obstructs too much light, but it gives a delicate soft effect to the picture. White pigmented gelatine gives an effect scarcely distinguishable in kind from opal glass, but as it can be used in a much thinner and more transparent layer, the softened delicate effect can be obtained without dullness; in fact, the degree of opacity is quite under the control of the photographer himself.

For focussing-screens we cannot imagine anything better. All photographers who use an eye-piece in focussing, in order to secure the greatest sharpness, are familiar with the difficulty they experience from the grain or texture of the ground glass being magnified, rendering the focussing of fine detail difficult. The infinitesimally fine particles of white pigment which produce the semi-opacity of the screen when formed of this substance will in no case confuse the finest definition, even under very high magnifying power. The one disadvantage which a screen of opal gelatine may possess would arise from the ease with which it may be soiled or scratched; but this may be prevented to a considerable extent by treating the gelatine with a solution of alum, which will render its surface hard and insoluble.

For preparing sheets of opalized gelatine the formula used by Mr. Burgess in his eburneum process will answer admirably; it stands as follows:—

French clear gelatine	...	...	5	ounces
Water	...	...	20	"
Glycerine	...	...	$\frac{1}{2}$	ounce
Oxide of zinc	...	...	1	"

After soaking the gelatine in the water for a few hours it is dissolved by gentle heat, and then filtered through flannel. The zinc white is placed in a mortar with the glycerine and one ounce of the water, and made into a soft paste. It is then stirred into the warm gelatine, and allowed to stand for a couple of hours, keeping the solution warm to allow the coarser particles to settle to the bottom; the upper portion is then carefully decanted to get rid of the sediment, or, if it be allowed to cool and become a jelly, a slice can be cut off the bottom, removing all the coarse particles. Where the photographer desires to make the sheets for use it will be wise to use up his solution at once, as it will not keep well, especially in hot weather. Where he wishes to keep it at hand ready to coat glasses, its keeping properties may be improved, and decomposition arrested, by the addition of a trace of carbolic acid, or a little essential oil of cloves will help to preserve it. Or if it be desired to keep the mixture ready for use on redissolving, it may be poured out on sheets of glass and allowed to dry; it may then be cut up into strips, and kept as dry opaline gelatine, which can be readily redissolved on adding the proper quantity of water.

We may add that it is Mr. Woodbury's intention, we believe, to prepare sheets of opaline gelatine ready for use, and supply them to photographers commercially.

THE MILITARY SCHOOL OF PHOTOGRAPHY AT CHATHAM.

On the occasion of a recent visit to Chatham, we availed ourselves of the opportunity to visit the military school of photography at that town. The school forms part of the Royal Engineer establishment at Chatham, an institution established for imparting instruction to officers and non-commissioned officers of the Royal Engineers in all branches of technical education. Surveying, construction and estimating, fortifications, telegraphy, and photography are the principal subjects taught, and these in a theoretical as well as practical manner; all young officers, on first joining the corps, being first ordered to Chatham to undergo a course of scientific instruction at the establishment before they are despatched to various stations to enter upon their ordinary duties. At the present moment, H.R.H. Prince Arthur, who has recently been gazetted to a lieutenancy in the Royal Engineers, is pursuing his studies at Chatham, and is going through the same course as that prescribed for all Engineer officers.

Instruction in telegraphy and photography is imparted under the superintendence of Captain Stothard, R.E., the latter subject being taught by Serjeant Instructor Church, to whose immediate care the whole of the arrangements con-

nected with photography are entrusted. Mr. Church, who has been connected with the establishment for nearly ten years, and possesses, therefore, very considerable experience as a theoretical and practical photographer, has been successful in devising a thoroughly systematic and effective mode of instruction. The students are mostly young non-commissioned officers, who, to the number of eight or ten, are formed into classes and trained in the art for several months; on their being deemed sufficiently skilled in their duties they are drafted away to stations where their qualifications may be made use of.

The school consists of a suite of rooms for operating, printing, and mounting, together with a glass studio of very fair dimensions. All the mechanical parts of the process are first taught, such as cleaning the glass plate, sensitizing and squaring the paper, collecting residues, &c.; then instruction is imparted in printing, toning and fixing, and similar subjects, and, finally, the students are allowed to operate. If any of the pupils show particular aptness for their work, these are entrusted with the more delicate operations of the processes, and in this manner the plan of instruction laid down is made to answer with much success. After a comparatively short period of training, Mr. Church is able to turn out photographers who are proficient in every branch of their art; and it may not be out of place to mention that Serjeant Harrold, who recently obtained considerable reputation in the manner in which he acquitted himself as chief photographer in the Abyssinian expedition was one of Mr. Church's pupils.

In passing through the printing-room our attention was called to a very fine series of dry-plate negatives which had been obtained by the coffee process. The films of these were very delicate and thin, and even in the highest lights there was a slight transparency; but although there was no portion of the image which could be termed opaque, nevertheless the pictures produced from these plates were remarkably brilliant, and free from all suspicion of flatness. An explanation of this apparent contradiction was readily offered upon a second inspection of the negatives, for it was found that the coffee had given to the films a yellowish, non-actinic tint, and had thus imparted vigour to what would otherwise have been but very feeble productions. The plates had been prepared about a week before they were used, and required a somewhat long exposure—about three minutes in a good light, or six times as long as would have been necessary with an ordinary wet plate. Mr. Church is of opinion that if a dry plate requires more than a minute's exposure, it matters very little whether they remain in the camera for two, three, four, or five minutes; he also believes that when working with coffee plates, which acquire a yellowish tint from the colouring matter of the preservative material, a prolonged exposure of the negative is always beneficial. For architectural or landscape photography the coffee plates were found to be everything that could be wished, and, owing to the soft, delicate detail always obtainable if the negative has been sufficiently exposed, there was a greater certainty of obtaining a good result than with wet plates in this particular branch of the art. A little care was necessary in the development of the first few plates, but after the operator had acquired some experience in the operation the negatives might be developed with the same ease and certainty as wet plates.

The unmounted prints in the establishment are kept piled upon one another in a perfectly flat condition, and the method adopted to prevent their curling up is a very simple one, although, we believe, not generally known. The dry albuminized print is laid, face downwards, upon a square of plate glass, and upon the middle of it is placed a stout paper folder, or angular piece of wood. The latter is pressed down upon the print with one hand while with the other the picture is drawn from beneath; after passing under this scraper two or three times, the print will be found to roll itself up inside out, becoming afterwards perfectly flat, in which condition it will remain for any length of time if

kept under slight pressure. The process of mounting is thus greatly facilitated, and the pictures, not being moist, are less liable to be torn in the operation.

The photographic duties of the school are not confined to the taking of landscape views and subjects connected with engineering, but a large portion of the work performed consists in the reproduction of plans and drawings, to be printed either by means of photo-lithography, or merely on plain salted paper. Thus we saw on the eve of completion a survey of the whole of the route taken by Lord Napier in Abyssinia, from Zoulla to Magdala, the mountains, rivers, and principal localities being all marked and noted. The map in question was of a somewhat large size, and had been constructed, we believe, from as many as eight negatives.

Again, in order to give the pupils sufficient opportunity for practising their art, a certain amount of private photography is allowed; strict regulations are, of course, in force to prevent a privilege of this kind being abused, and pictures of members of the corps of Royal Engineers only are allowed to be taken, the photographers paying the cost price of their portraits. In this way the non-commissioned officers under instruction enjoy greater facilities for gaining skill in their profession than could be obtained in the ordinary routine of their duties.

No special arrangements have yet been devised for carrying on photography in the field. Mr. Church, *en attendant* the advent of a perfect dry-plate process, prefers to use the ordinary dark tent, which is packed in a box fitted on wheels, ready to be run out at a moment's notice. This may not be so convenient as a dark wagon or portable laboratory, but when packed it is much more likely to resist the dangers of transport and rough handling, and, being of small dimensions, it is readily conveyed to its destination. For campaigning the expanding camera is of course used, and the bottles, trays, developing cups, and other utensils employed are either of ebonite or gutta-percha; duplicate articles of a perishable and fragile nature, such as focussing glasses, &c., are always carried, and the packing of the apparatus in a perfectly rigid manner is a subject carefully attended to. By dint of a few simple precautions of this nature, strictly enforced, out-door photography is carried on in a sure and systematic manner, and failures and mishaps are of rare occurrence.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

SUMMER TROUBLES—PHOTOGRAPHIC SECRETS—PHOTOGRAPHIC IDENTIFICATION—THE NEW MILTONIC POEM—PHOTOGRAPHY AT WIMBLEDON—A NEW MANUAL OF PHOTOGRAPHY—PIRATES AND SPIES—RETOUCHING NEGATIVES—THE SOCIETIES.

SUMMER, although the season of sunshine, is not generally the best season for sun pictures. Either spring or autumn is better, as a rule, either for portraiture or landscape. The portraitist, indeed, generally anticipates a variety of troubles in the shape of fog, stains, and pinholes, arising from the high temperature. It is not a little surprising that this summer, the hottest, driest, within the memory of middle-aged folk, there have been fewer photographic troubles than usual. I mean, of course, that I have heard of fewer, after consulting a moderately large circle of photographic acquaintances, and I have experienced fewer myself. The drying of the plate when long kept is the only trouble I have had, and the excellent system of washing the plate and re-dipping before development, which you recently described, has proved a perfect cure. I had tried the system before, but always with a necessity of giving longer exposures, in order to secure good results. Mr. Hughes's plan of prolonging the second immersion of the plate until the film is again thoroughly permeated by the nitrate solution, however, removes every difficulty, and, with the ordinary exposure, gives

perfect results, and I for one am deeply indebted to you and Mr. Hughes for the hint.

Speaking of this indebtedness, suggests to me some thoughts on the extent to which photography as an art, and photographers as a body, are under obligation to the large band of experimentalists and volunteers who have contributed so largely to the unparalleled progress made in little more than a quarter of a century. I heard a photographer remark the other day that he thought nothing had contributed so much to ruin photography as a profession as the practice of some of the best professional photographers of publishing all they know, and so enabling the least cultivated photographers a fair chance of competing with more experienced men. I could not help smiling to think how little the speaker recognized his own obligations to this habit of communicating their knowledge, in which our best men most frequently indulge. I wonder how many, or, rather, how few, of even the most capable photographers would have found out for themselves all that is known of photography, unaided by the published experiences of others. Surely never was an art to the devotees of which the injunction could so properly be applied: "Freely ye have received; freely give."

The value of photographic identification is so well recognized that it scarcely needs affirming; but it is interesting to note the specially important cases in which it serves great ends. We all remember the important part it played in securing the capture of the murderer of Mr. Briggs; the discovery and identification of another murderer has just been made by its means. The wife of a coffee-house keeper, in Norton Folgate, was some months ago beaten to death with a rolling-pin by her husband's apprentice, who got clear off, and no clue could be obtained as to the direction of his flight. It seems that just after committing the murder he was convicted at Woolwich for stealing a meerschaum pipe, and sent to gaol; there a warder, having seen the photographic portrait of the murderer, which had been circulated, noted the likeness to the prisoner committed for theft, and so on further examination he was identified, and will, doubtless, suffer the penalty of his crime.

Yet another aid to identification has come under my notice. Literary circles have been in a state of excitement during the last few weeks in regard to the discovery of a new poem supposed to be Milton's. Mr. Henry Morley, Professor of English Literature at the London University, has found written on the fly-leaf of a copy of Milton's works, at the British Museum, an unpublished epitaph, or, rather, as Mr. William Sawyer has justly pointed out, three epitaphs, bearing the signature J. M. The style is regarded by good critics as essentially Miltonic, but the genuineness of the lines as those of Milton has been the subject of hot discussion. Decision on the matter depends chiefly on the question of handwriting. If it can be shown that the lines are in Milton's handwriting, and that the signature is veritably J. M., and not, as some assert, P. M., the point will be virtually settled. As the lines can only be examined at the Museum, and as the best means of comparing them with the handwriting of Milton do not exist at the Museum, photography comes in as a *deus ex machina* to meet the difficulty. Mr. Valentine Blanchard has, I understand, been commissioned by Mr. Hain Friswell (the editor of the series of works in one of which Mr. Morley was engaged when he made the discovery) to make a photographic facsimile of the epitaph for publication in the new work. The facsimile can be readily compared with Milton's handwriting, and will, I understand, be compared with the original MSS. of Milton's Poems, in the library of Trinity College at Cambridge, as affording more complete evidence than can be obtained by comparing it with Sotheby's facsimiles, which have so far been used as the test.

The mention of Mr. Blanchard's name reminds me that I have seen some capital instantaneous groups secured by that

gentleman at Wimbledon, although working without shelter in such a tropical heat must have been trying work, and in no wise favourable to instantaneous photography.

A new scientific manual of photography, or rather of the chemistry of photography, by Mr. Carey Lea, will, I understand, shortly be published. Photographers will doubtless look with interest for such a work from the pen of Mr. Lea, who is doubtless an able contributor to scientific photographic literature. It is odd enough that in this country no great work on photographic chemistry has been published. In France the Photographic Chemistry of Barreswill and Davanne forms an extended and important work. In this country Hurdwich's "Manual" has been the only work devoted to this subject; and that never very complete or satisfactory work,* has necessarily been getting out of date since Mr. Hurdwich's retirement from photography half-a-dozen or more years ago. I shall look for the new work with interest.

The case *Graves v. Mercer*, tried at Dublin, possesses considerable interest for all concerned in the use of photography as a means of popularizing art by means of photography. I believe that few things can have a more valuable influence on the art education of a country than the circulation of good photographic reproductions of works of art. A very large store of the best things of this kind are not copyright, and may be circulated freely without trenching on the privileges of any one. But if the statement of the case as it at present appears be correct, no one can enter into the business of publishing such reproductions without being subject to the machinations of informers, who, if they fail in all means of inducing the dealer to procure for them copyright works, are under the temptation, in order to secure penalties, to swear falsely that they have been supplied with copyright works by persons who have honestly determined to steer clear of all connection with copyright reproductions. When spies or informers are used to detect crime, there is always a risk that they will manufacture cases rather than fail. On the other hand, publishers such as Mr. Graves have suffered so severely that they are naturally resolved to avail themselves of all legal means to hunt down and root out the dishonest destroyers of their trade. No one can blame them. They must possess the sympathy of right-minded people. They will doubtless, as they affirm they do, obtain the best men they can for the work, but stamp out piracy they will at all hazards. It is a hard thing in such a case to hit the *juste milieu*; when sweeping means are used to secure the punishment of criminals, it is hard to avoid at times involving the innocent in the punishment.

The *dernier mot* on the question of retouching negatives has not yet been said in this country, I apprehend. Very few of our English portraitists seem as yet to have fully realized all the advantages to be gained. The example which appeared in Dr. Vogel's *Mittheilungen* strikes me as almost startling. Two portraits have been taken at one time on one plate. The face is that of a young girl with an apparently coarse, spotty, and freckled skin. Such at least is the effect of the print from the untouched negative. Such a portrait could scarcely be acceptable to any one: it exhibits in a forcible manner the offensive exaggeration with which photography at times treats physical defects. The adjoining print is from the touched half of the negative. It is impossible to detect any alteration which should affect the likeness. Form, light and shade, everything is the same except the coarse spotty texture, which is substituted by a refined smooth skin; a change which most persons would hail with delight, even if it erred a little in a direction opposite to the exaggeration of photography pure and simple. I think experiment in this kind of modification is well worth the attention of all portraitists.

Few of the societies are meeting. It is refreshing to

* I looked the other day to the Vocabulary of Photographic Chemicals in this work for "bromide of cadmium," and found no mention of it.

find that some of them have the courage in this exhausting weather to hold meetings. I see that the Liverpool Amateur Society is active. The system of giving prizes adopted appears to induce a pleasant emulation, and is, I think worthy of the consideration of other societies. A gentleman present at one meeting of this society, I find, pronounces india-rubber mounting, after some experience, a "delusion and a snare," an opinion in which I cordially concur. Another gentleman gave strong testimony to the excellence of Mr. Bovey's toning bath. Mr. Bolton described his experiments with a new preservative, for further particulars of which I shall look with interest.

SHORT ESSAYS ON PHOTOGRAPHY AND ART.

No. I.—THE ACADEMY EXHIBITION OF 1868.

BY NELSON K. CHERILL.

ANOTHER exhibition of the Royal Academy has run its appointed time and has closed, not without its lessons to the art student and the public at large. The show of pictures this year has been considered, on most hands, as very far inferior to that of former years, not that it was less in number, for the academy is always full, and more pictures are rejected than hung every year, but simply, in the opinion of most people, the pictures were not up to the mark of excellence, which, from the productions of former years, they might have had reason to expect. However this may be, there was this year an abundance of material from which the photographer might take a lesson in the artistic application of the power so easily within his control; no exhibition of the Academy ever yet was so bad that nothing could be learnt by it, even if nothing in it could be admired; the very defects of the pictures would form a most valuable lesson in art to those who may wish to improve.

It is not from a wish to dogmatise about what ought to be and what ought not, that these few general observations are penned, but more from a desire to promote that discussion of the art powers of photography, which has of late tended so much to improve its practice.

There is a much disputed question which now and then crops up with regard to portraiture in the open air, namely, one about the proper height of the horizon line. Some have argued that if the junction of the sky and land be at any other level than the height of the head in the sitter it is simply wrong; this seems nonsense to me, because, suppose there are two sitters in the picture of different height, or suppose one sits down and one stands up—a thing I suppose more or less possible in nature, if not in art—where is the horizon line to be put? Of course the real position of the line in question is the height of the eye of the spectator, or, in photography, of the lens of the camera; but it is not at all necessary that the lens should be the same height as the eye of the sitter, indeed, when it is so, it has to be considerably inclined downwards, therefore in most cases the horizon line should be below the height of the head in the picture. About one third the way up the plate seems to be a proportionate height in the usual way; and in confirmation of this view I am glad to notice that it is decidedly the rule in the Academy Exhibition this year, and that in almost every case the horizon line was below the shoulders in pictures of the kind I have been speaking of. So long, however, as photographers wish it to be their boast that their art is more true to nature than painting, they must remember in each picture to keep the horizon line at the exact height which it makes in that picture.

Another point seems worthy of notice here, it is one which, although not exactly bearing on any subject connected with photography, cannot, I think, fail to be of interest among photographers; the amount of colour which may be used in a picture. There is a fashion in everything, and just now the fashion among a certain set of artists is to paint, in various shades of white, instead of in colours, as it is usually understood. The object seems to be to obtain "tone,"

literal and exact tone, instead of colour which may be a little out of tone if carried out fully. The question, how far this may be right, will not, I think, prove uninteresting to photographers, at least it should not do so. The pictures in tone may be divided into two classes, merging more or less into one another—those which absolutely represent the thing they profess to do, and those which represent only the tone of a subject which must contain a great deal of colour as well. In the first of these, of course, the absolute representation is all that can be given, and so long as that is obtained the only question left to the critics are those concerning the choice of subject and general treatment; but when a highly-coloured subject is represented in a tone mostly composed of white, with a slight sensation only of any other tone, it seems to me open to very grave objection; objection, I mean, on the score of setting up such work as a standard of comparison of art works in general. No doubt any man has as much right to paint a picture all white as another has to paint one all blue or all green, only let not a picture which is true to fashion but not to nature be set up as a standard of such paramount excellence as to rule not only the present but all future generations of artists. Fresnoy not inaptly says,—

"The hand that colours well must colour bright,
Think not that praise to gain by sickly white."

This idea has been, as I before mentioned, rather to obtain all the tone, and but little of the colour of a picture, than all the colour, or as much as possible, and but little tone, or only as much as may "come." This seems to me wrong upon the face of it, for painting is essentially the art of colouring and not of monochrome; it is the object of engraving to translate colour into black and white; while it is the object of painting to transcribe colour as it is, or as it may be supposed to be, in the eye or mind of the artist.

A photograph should be the most perfect picture for tone that can be produced; the relation should be absolute between all the several parts. There is, however, another reason, a more complete and perfect one why painting in this "tone," which is coming now so much into fashion, is wrong; it is that the harmony of tone so much prized is gained by what looks very like a sacrifice of truth. The harmony of tone in nature begins with white, or the lightest shade of some colour which for the present purpose we may consider white, and ends, frequently, in the deepest black possible, so deep that no amount of black paint or any mixture of paints, can come near to it. But these painters of tone do not by any means represent this long range of natural colour or gradation; they say, we will paint harmonies, beginning with white and ending with white, with a little colour in it. A harmony, no doubt, they paint, but not one that can be found in nature, and it seems to me a very grave question whether nature should be represented in a manner in which it does not represent itself. It is, of course, thought tremendously clever to be able to paint a picture all of one colour, and yet to have the wonderful harmony of tone in it. But are cleverness and "trick" the highest aims of art? or even aims worthy of art at all? I think not. So long as photographers possess their present powers it is much to be hoped they will use them to the best advantages they can, and not be led by a false notion of aping art to try and make "symphonies" instead of pictures, because if they do they will certainly fail and that without remedy.

There is another thing worth mentioning as being a thing to avoid in a more or less mechanical art like photography, even as it should be more avoided than it is in all art; I refer to the introduction of absolutely impossible accessories. In one notable picture in the exhibition this year was an incongruity, which if any smaller man, a "Lancelot or another," in art had done, it would be said by all to be nothing less than absurd. On the same canvas, and at the same time, are represented in different parts of the same picture, two incidents which by their very nature must have been in reality separated from each other by some fifteen

hundred or two thousand years. It may be said that art is imaginative and, therefore, cannot be bound to time, or place, or circumstance. True; but should art *not* be in some sense bound to possibilities? Why should it not be so? All things in reason are possible, even if they may not be probable. Photographers have certainly no right and no power to attempt strictly imaginative pictures; it is even argued by some that nothing should be represented by the camera prior to the invention of photography; that is, that no scene should be "got up" and photographed, and then said to represent something that occurred prior to the invention of the art of photography; and the argument on which this is based is not so much the incapacity of photography to represent such scenes with good pictorial effect and even some degree of truth, but from a feeling of inaptness or incongruity in a modern art being used to portray ancient events. How far this argument holds good it is not my present purpose to consider; but it seems to me that if photography is not allowed to represent events at which the camera might have been present, much less should artists represent events at which not only they were not present but which never happened for them to be present at. Here seems to me to lie the great distinction between an art mechanical and an art not limited as to its means of representation. The one is compassed by the uniformity of present accidents while the other is bounded only by the imagination of the artist. But should artists use this greater freedom to imagine things not only impossible but absurd in themselves? And should not photographers, also, take a hint, and in their arrangements of present pictures avoid such accessories as may lead to the same "blooming errors"?

THE LATE M. CLAUDET.

THE last number of our excellent contemporary, the *Scientific Review*, contains a long and able article entitled "Claudet: a Memoir." The writer—one of M. Claudet's most intimate friends, and one with whom we have had the fortune to spend some very pleasant hours in M. Claudet's company—gives a very complete and graphic sketch of the public life and scientific labours of the veteran photographer, regretting, however, that owing to the death of Sir David Brewster, who had undertaken to write a memoir of Claudet, an adequate testimony to his scientific worth must remain unwritten.

After briefly stating the birth of M. Claudet, in Lyons, in 1797, and his connection with the glass works of Croisy le Roi, he proceeds:—

M. Claudet came to London to establish the sale of glass shades, sheet, and other glass not then manufactured in England. In 1833 he invented the machine now generally used for cutting all cylindrical glass. For this invention Prince Albert awarded him the medal of the Society of Arts, in 1853. But all this while he was a student of science, training and waiting for the object to which his true life was to be devoted. The path was opened to him by the almost simultaneous realizations of photography by Daguerre and Fox Talbot. In citing those well-known names, we do not forget Niepce, the noble pioneer of the photographic art. His imperfect results, and those of Wedgwood, *Davy*, and others, had not aroused the interest of men of science. Even the achievement of Daguerre was received with the coldness of incredulity; but Claudet saw at once the breadth and beauty of the prospect it opened, and dashed into photography with a warmth and resolution that took his associates by surprise. He was by title a "photographer" before the name was known or photography believed in. We remember him then. Ours was the spring-time of life, his the meridian. We caught his enthusiasm, we became his disciple—as who would not that felt the influence of his gifts and acquirements, and witnessed his unflagging energy, his heroism of purpose? There he would be, day after day, among the fumes of mercury and iodine—careless of life or health—experimenting, producing, expounding, never tiring, never exhausting the fecundity of his expedients, never desponding in his aspirations. And, happily, he was found equal to what he undertook. When at first chemistry had to be called in aid, he was a chemist (as testifies Francois Arago).^{*} When later, optics had to

be appealed to, he was a mathematician; when mechanical science was to be invoked, he was an ingenious mechanic; when art was required, he was an artist of consummate taste; whatever new resources had to be sought, he was ever ready, for the spark of genius was there, needing but the breath of opportunity to fan it into the flame of achievement.

Thus qualified, Claudet (1840) took up photography as a philosophical pursuit; and henceforth literally his days were devoted to the practice, his nights to the theory of the new art and science.

Referring to M. Claudet's early experiments in increasing the sensitiveness of the Daguerrotype plate, the writer says:—

The operation was thus made a hundred times more rapid, and hence Claudet has the credit of first rendering possible the effectual portraiture of animate objects. So sensitive had he now made his metal tablet that he obtained a portrait by the oxyhydrogen light in fifteen seconds; an impression of black lace by the light of the full moon in two minutes, and by the light of the stars in fifteen minutes; an impression of a sculptured figure by the light of a candle in fifteen minutes, and the same from the light of a lamp in five minutes; and an image of the moon in four seconds.

After enumerating many of the early scientific contributions to photography of M. Claudet, he gives, in speaking of the stereoscope, an excellent extract from one of his papers on the subject:—

"The stereoscope is the general panorama of the world. It brings to us, in the cheapest and most portable form, not only the picture, but the model, in a tangible shape, of all that exists in the various countries of the globe; it introduces us to scenes known only from the imperfect relations of travellers; it leads us before the ruins of antique architecture, illustrating the historical records of former and lost civilizations, the genius, taste, and power of past ages, with which we have become as familiarized as if we had visited them. By our fireside we have the advantage of examining them without being exposed to the fatigue, privation, and risks of the daring and enterprising artists who, for our gratification and instruction, have traversed lands and seas, crossed rivers and valleys, ascended rocks and mountains with their heavy and cumbersome photographic baggage."

"Claudet was," remarks the writer, "endowed by nature to be an investigator. A watchful and sagacious observer, he was quick to detect coincidences or exceptions, and untiring in pursuit;" and he proceeds to point out the acuteness which distinguished his researches in the by-paths as well as the high-roads of science, especially as related to his favourite studies. "Thus," he says:—

In his paper on "The Phenomenon of the Relief of the Image," he observed "that the image formed on the ground glass of the camera obscura appears as much in relief as the natural object when seen with two eyes, and his experiments have disclosed the singular and unexpected fact that, although only one image *seems* depicted on the ground glass, yet each eye perceives a different image. The image seen by the right eye is the representation refracted by the left side of the lens," and *vice versa*. "Consequently, these two images presenting two different perspectives, the result is a stereoscopic perception, as when we look through the stereoscope at two images of different perspectives." He then explains that he ascertained these facts by many experiments, "the most decisive of which consists in placing before one of the marginal openings of the lens a blue glass, and before the other a yellow glass. The result is two images superposed on the screen of the camera, one yellow, the other blue, forming one image of a grey tint, the mixture of yellow and blue, when we look with both eyes at an equal distance from the centre. But when we shut alternately, now the right eye and then the left eye, the image appears first yellow, and second blue."

And, again:—

Sometimes, too, he allowed himself to stray from his chief garden of delight into outlying paths; and we find him at the British Association describing his "Star Chromatoscope—an instrument for examining and comparing the rays of the stars." The purpose of this instrument is "to develop an infinitely small spot of light into a large circle, exhibiting on its periphery the various rays emitted by the star, all following each other in spaces corresponding with their duration; showing also blank spaces between two contiguous rays, corresponding with the black lines of the spectrum. We have, in fact, a spectroscope by which we can analyse the particular light of any star; and, further, by this instrument we may arrive at the discovery of the real cause of the scintillation, and compare its intensity in various climates and at different altitudes of a given star." Or, again, we have a discourse "on moving photographic figures, illustrating some phenomena of vision connected with the combination of the stereoscope and the phenakistoscope, by means of photography." "Our sensation of vision," he says, "is not in the eyes, but only in the single sensorium of vision, to which both eyes convey their separate perceptions." Again, he gives us "A new fact

^{*} "M. Claudet, qui a trouvé le moyen de réduire à quelques secondes la durée d'exposition dans la chambre obscure."—Œuvres complètes de Francois Arago. Tome vii., p. 516.

relating to binocular vision," to illustrate the persistence of the impression made by light upon the retina. At the conclusion of this paper he modestly as justly adds that Professor Wheatstone by his admirable discovery—the pseudoscope—has left very little for further investigation in the physiology of binocular vision. He expounds with generous praise the inventions of others, as in his paper "On the principles of the solar camera." "Such," he says, "is the essential principle of Woodward's solar camera. * * * This principle is truly marvellous. * * * Without question, its introduction into the photographer's studio will mark a period of considerable improvement in the art."

The demands upon our space preclude further extract this week, but we shall return to the article in our next.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XXVIII.

"When the composition is kept dark, forming a mass of shadow in the centre of the canvas, the light is often conducted round it by means of the sky, water, or light foreground; and as the dark becomes, in a manner, isolated, it receives great vigour and importance. If a clump of trees, such as we often find in Claude, is to be represented, their stems shoot out from a ground of the same darkness, thereby producing a union of the trees with the shadow which they cast on the ground. As a light in the centre of dark tints must thereby acquire an increased consequence, so a dark in the middle of light tints receives the same importance."—BURNETT.

CHIAROSCURO—(continued).

An arrangement of light and shade not so much regarded now as a strict rule, called "the three lights," at one time was considered to be indispensable to a good picture, and is, indeed, a very pleasing effect of chiaroscuro, including in itself every element of success, unity, variety, and repetition. It was Sir Joshua Reynolds who first enunciated this precept: "The same rules which have been given in regard to the regulation of groups of figures must be observed in regard to the grouping of lights; that there shall be a superiority of one over the rest, that they shall be separated and varied in their shapes, and that there should be at least three lights: the secondary lights ought to be of nearly equal brightness, though not of equal magnitude, with the principal."

The following sketch will give some idea of the arrangement.



Fig. 1.

It will be seen that the three lights are placed at unequal distances from each other, and form an irregular triangle. The chief light—that in the sky—is brighter and broader than the others; it is repeated by the secondary light on the cliff, and carried off by the light reflected in the water on the left hand.

The most beautiful effects are often produced with the simplest materials; but it is very difficult to persuade photographers, who have such ample means of rendering detail, and whose pictures are as easily and as highly finished if they are full of subject as if they had very little in them, to be content with sufficient material for pictorial effect. With

painters all the force of the palette and all the skill of the artist are frequently employed by such simple materials as a straight and low horizon meeting the sky. On such subjects the most skilful resources of the art are necessary, and enable the artist to show his strength. How very seldom is a photographer content to keep his horizon low, and depend on the sky for effect! Fig. 2 is from a photograph in which this arrangement has been observed, and in which the view, without being too much suppressed or neglected,



Fig. 2.

has been subordinated with great advantage to the general effect. A proper union and sympathy between the parts of the picture have been kept up by means of the broad mass of light which occurs in the sky, and is repeated on the ground. This illustration also shows the extreme value of carefully chosen and placed figures in a landscape. The one figure being white and the other black, collects the scattered lights and shades in the picture, and reduces them to proper subordination. The use of extreme black and white in small quantity and in juxtaposition is also exemplified in fig. 3.

A method pursued by Turner, and followed since by many artists, is most effective. Instead of relying on a small portion of light surrounded by large masses of dark, as Rembrandt did, Turner understood and exemplified in many of his best works the extreme value of small masses of dark set in a border of light, but never unsupported by other spots of dark. This was often obtained by rearing a dark tree against a light sky, balanced by dark figures in the foreground, which is usually light; between the foreground and the distance is generally a mass of shade uniting the two. The illustration figure 3 is constructed on his



Fig. 3.

"View of Orvieto," and is one of the many pictures painted by Turner that shows the principle clearly. This was one of the pictures so treasured up by the artist, in order that he might leave them to the nation, that no money could buy them. A bold sweep of landscape, to the left of which rise a tree and a dark mass of foliage; in the foreground, which is varied with that minute subdivision of lights and darks which made this artist's effects, like photography when

rightly understood, so elaborate and yet so broad, the dark parts of the dresses of two women, who are washing at a classic fountain, repeat and support the dark tone of the tree; the dark vine leaves brought out prominently on the light masonry also perform the same office, and extend the shadow to the extreme right. The only bits of pure white in the original are on the woman's dress in connection with extreme dark (see last chapter), and the piece of paper on the lute. These minute bits of pure white are placed with a definite purpose and with extreme art, and help to bring forward the foreground and throw back the distance. In the distance, on a rocky eminence, stands the town of Orvieto backed by mountains, which is all treated with great tenderness and delicacy. The general arrangement of masses will be found somewhat similar to that described in chapter 27, figure 2.

Few photographs have been taken uniting extreme force in the foreground with delicate and tender distances and skies. There is no reason, save that of a disinclination to take much trouble over such a simple thing as a photograph, why they should not be done. If photographers would say to themselves, "This scene is as well worthy of my undivided attention and of all my skill as it would be that of a painter who would not hesitate to spend some weeks in painting it," they would probably produce better results. I have never yet been able to see why a photograph should be confined to one exposure for foreground and distance, any more than it should be considered legitimate that an etching should have one biting only. In etching, the artist exposes his plate to the acid a longer time, and bites deeper for the deep shadows than for the lights; if he did not, he would get no variety of light and shade, and his work would be thin and weak. In photographing such a view as the one of Turner's we have taken for illustration, I can see no reason why the foreground should not be obtained in one negative, giving sufficient exposure to bring out the necessary detail in the shadows; and the distance and sky on one or more negatives, suiting the exposure to the effect required. The only technical objection would be, that it would require skill in the printing, which, in the eyes of many photographers, would be an immense advantage, the "fatal facility" of the art for producing rubbish being the great cause why photography as an art has not advanced further than it has done.

Difficulties in art are necessary to its existence. If there was nothing to overcome there would be no incentive to exertion, and art would soon become a mechanical trade. Opie was always of opinion that the internal difficulties of painting were its very best friends, and, in one of his discourses at the Academy related, the following apposite anecdote to prove his statement:—"Two highwaymen (says a certain author), passing once by a gibbet, one of them, with an ill-boding sigh, exclaimed, 'What a fine profession ours would be if there were no gibbets!' 'Oh, you blockhead,' says the other, 'how much you are mistaken! Gibbets are the making of us; for if there had been no gibbets every one would be a highwayman!'"

ON THE PRINCIPLES OF LIGHTING AND CONSTRUCTING STUDIOS.

BY DR. H. VOGEL.

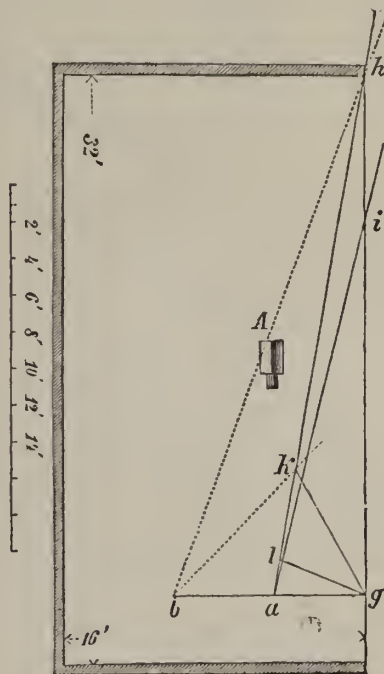
CHAPTER II.

In my first chapter I have explained the chief principles of calculating the direct brightness in a glazed room, and pointed out at the same time, by a series of examples, the consequences arising from that calculation, previously neglecting the effect of the light reflected by walls, &c., and the loss of light produced by reflection during the transmission of light through glass.

To those who have followed attentively our explanations it will be of no difficulty at all to determine the amount of

the light which falls on any point in the studio. With small apertures we can very easily calculate the relative amounts of light at different parts of the room; with larger windows, which have some influence on the illumination, the best criterion is afforded by constructing the angle of light. To this purpose the studio (or a piece of it containing the acting glazed surface and the point which must be illuminated) must be drawn on paper, sketch and ground-plan, and the angle of light constructed in the horizontal or vertical direction. These are not yet all the possible or interesting instances; indeed, there could be written a great volume on this subject. In these lines I only propose to write upon the effects of our most important constructions of studios.

In my diagram I suppose a studio with its glazed side



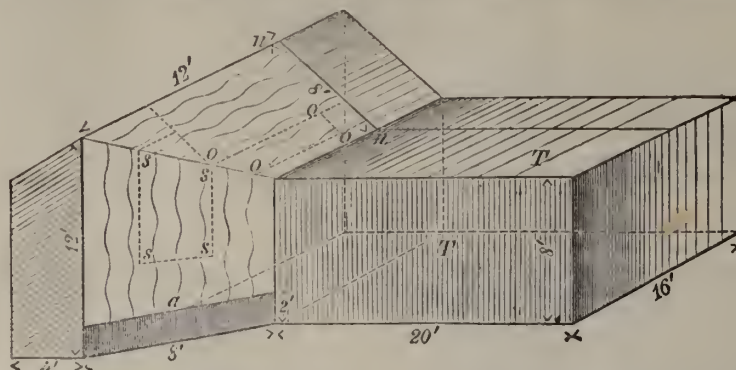
directed northwards. It is 32 feet long and 16 feet broad; there is no interruption in the wall, and the front, $h g$, lies northward. At $a l$ suppose a person at a distance of 5 feet from the glazed wall and of 4 feet from the back wall; the curtains are drawn in the space $g h$ (28 feet). If we wish to state the effect of the glazed wall, $g h$, of 28 feet long, we are obliged to construct the angle of light $g a h$. Now suppose, instead of the long glass wall $g h$, another, $g k$, not directly situated northward, and of a length of 8 feet; the angle $k a g$ will then be exactly as great as $h a g$; that is to say, this small aperture of only 8 feet long will provide the studio with as much light as the other wall of 28 feet long; nay, even a wall, $g l$, of only 5 feet long, would afford the same amount of light to the person at a , but this would not be quite applicable, because the edge of the wall at l would conceal a great deal of the field of light to the apparatus at A .

I have now proved that we could employ an inclined wall of 8 feet long instead of another of 28 feet without decreasing the original amount of light. The same is the case with glass roofs. A straight skylight of 28 feet could be substituted by an inclined one of only 8 feet long.

If I now construct a studio with such a wall and an analogous skylight, I get a room which, as to brightness, totally equals the great studio of 32 feet long. The effect of light would even be much greater with the small glass wall $g k$ than with $g h$, as with the latter the light falls in under a

very great angle, and therefore much more is lost by reflection.

The form of the studio of the above-stated description is to be seen in our diagram. The parts not hatched are glazed, the others dark; the apparatus is to be placed into the dark room, T T, the person, however, at *a* near the glazed wall.



studios—and I have proved that, under the quoted conditions, it is of the same effect for single portraits as a great studio fronting to north. Such a studio would entirely suffice to amateurs and little photographers. The side wall is best fronting to north, because by this means the lateral and chief illumination is kept free from direct sun rays. The roof must be screened by sails. If there is not room enough, the depth may even be smaller than 16 feet.

If such a studio is sufficient for taking single portraits and recommends itself by its great cheapness, it has also its faults, if compared with the great studio fronting north. First of all, the person receives light always from the same side (in our diagram from the right side), whilst in a north studio, according to the position of the sitter, he will receive his light either from the right or from the left side. This fault, however, is not very great. Mr. Reutlinger's excellent portraits, for instance, are all illuminated from the left side.

A greater drawback however arises if the sitter is not placed quite near the glass, but a little further removed from it. Supposing a person at *b*, at double the distance from the glass than *a*, we can judge of the effect of light by drawing the lines *b h* and *b g*, and thus constructing the angles of light *h b g* and *k b g*; in the diagram we instantly perceive that *h b g* is much greater than *k b g*, and consequently that for a point situated at a greater distance from the glass, the amount of light is considerably greater in a studio fronting to north.

In a tunnel studio we must therefore be contented, in our operations, with the room in the direct neighbourhood of the windows, whilst a north studio allows you to extend much more towards the depth, and therefore affords more scope for artistic arrangement, and undoubtedly better illuminates groups which require the whole depth of the studio.

From the physical point of view I now have pointed out the effects of a tunnel studio and of a studio pointing to north. Accordingly to the above-given principles, everybody can easily perceive himself alone how the effect will be changed if the dimensions are altered, as supposed above.

NOTES ON DEVELOPMENT.*

DEVELOPERS which contain a copper salt are sometimes instrumental in causing the negative to be covered with a brownish fog, which, on account of its characteristic colour is easily distinguishable from that generally met with. This fogging may either cover the whole of the picture, or

The depth of the roof is 12 feet. For single portraits it would not only suffice but even be much too great, and only on exceptional occasions it would be used all unveiled. Thus, starting from the principles of the most simple illumination, I arrived at a construction of studio, which, in fact, has already been employed—as, for instance, on the great tunnel

a portion only of the image may be affected by it; but in any case the defect is not superficial, but lies between the glass plate and the film, that part of the negative being most damaged where the collodion layer is thickest. These observations lead to the conclusion that the injury is due to a particular condition of the collodion film, and that this view of the matter is correct was proved by the following experiment:—

Two plates were coated with strongly iodized collodion—such as is generally used—and one of them being placed in the sensitizing bath as long only as was absolutely necessary, while the other remained in the bath a few minutes longer. After exposure in the camera they were both developed with the following compound; viz:—

Sulphate of iron ...	...	...	3 parts
Moist sugar...	...	...	3 "
Sulphate of copper ...	...	...	3 "
Acetic acid ...	...	...	3 "
Water ...	...	...	100 "

The second plate yielded a perfectly clean and pure negative, while the first was totally covered with a thick fog; the reddish brown precipitate lay under the image, and was greater at the end of the plate from which the collodion had been drained than at the other.

From this result we may therefore conclude that in the film of the first plate undecomposed salts of iodine was present, which, combining with the copper of the developer, formed red iodide of copper. The silver reacts slowly upon the iodine salts, being at first prevented from entering into combination with the same by the ether contained in the collodion; it is natural to presume, therefore, that in a thick layer of collodion, undecomposed iodide may still be present, and from this we may deduce the precept that the plate should not be removed from the bath too early, if a copper developer is subsequently to be employed. With thin and porous collodion, obedience to this rule may not be of so much importance as when a material of a thick consistence is used.

The above experiment teaches us one more lesson; viz., that the smooth flowing of the silver solution over the negative on its exit from the bath is no proof that a complete conversion of the soluble iodide salt into iodide of silver has taken place.

In earlier times much discussion took place upon the relative merits of pyrogallie and iron developers for wet plates, and finally it was generally decided that the iron solution was the most energetic developer, and yielded, therefore, quite as soft and detailed a picture, with a short exposure, as the pyrogallie acid did after a longer one. Iron development is now universally employed in conjunction

* Photographisches Archiv.

with a subsequent intensifying operation with pyrogallie acid.

The solutions in general use of these two materials are of very different strengths, for in employing one part of pyrogallie acid we generally add at least ten times as much water as would be added for one part of sulphate of iron. This hardly seems right, seeing that the iron is already a much more energetic reducing agent.

We have lately been experimenting with a 5 per cent. solution of pyrogallie acid, using, therefore, the latter material in the same degree of concentration as iron is employed, and with this developer we treated a series of portrait negatives. All of the pictures were perfectly free from spots and stains, and so vigorous and intense that it was necessary to proceed rapidly with the operation of washing to prevent the films from becoming too opaque. The period necessary for their treatment was only one-third that required to produce negatives with the iron developer and pyrogallie acid intensifier, and the pictures obtained were quite as soft and delicate as those developed with iron. The only drawback in the method was that the slightest traces of dirt upon the glass caused the deposit of a light metallic precipitate; there can be no doubt, however, that the strong pyrogallie developer brings out the weaker light rays more satisfactorily, and yields, therefore, negatives more harmonious in their character than are obtained by the sulphate of iron solution.

ON NITROGLUCOSE.

BY M. CAREY LEA.

As nitroglucose has been much less studied than its congeneric nitro-substitution compounds, pyroxyline, xyloiline, and nitroglycerine, a few words on its preparation and properties may not be uninteresting.

The substitution does not take place in sugar with quite the same facility as with cellulose; the acids need to be stronger, and the temperature lower. The sugar, moreover, appears at first to dissolve, and then to separate out again in the form of a greyish paste, which, when thrown into water and freed from the adhering acid, becomes nearly white.

An attempt to prepare nitroglucose by the use of nitre and sulphuric acid, which succeeds so well and so easily in the case of cellulose, failed almost wholly with sugar. Not more than two or three per cent of the weight of the sugar was obtained.

With sulphuric and strong nitric acids, allowed to cool thoroughly after mixing, the reaction takes place easily, and a considerable quantity of nitroglucose is obtained. The nitric acid should be as strong as possible, and, as the acid of the requisite strength is not easily obtained commercially, I have found an advantage in using in part the fuming sulphuric acid. Two fluid ounces of fuming sulphuric acid, 2 of common sulphuric, 2 of strong nitric acid, as near to 1.5 sp. gr. as can be obtained, give good results. The sugar is stirred in, in the form of powder, to a thin paste. The stirring is kept up, and as fast as the nitroglucose separates in doughy masses it is removed with a spatula and thrown into cold water. A further addition of sugar will give more nitroglucose, but considerably less in proportion than the first addition. As soon as possible, the nitroglucose is to be kneaded up with cold water, to get the acid out. In one case, when this was neglected for ten or fifteen minutes, the nitroglucose passed to a greenish colour, and apparently was undergoing a commencing decomposition.

The removal of the adhering acid is much more difficult than in the case of pyroxyline, and is an extremely disagreeable operation. The acid pervades the whole of the doughy mass so fully that the fingers are stained and burned by it, nor can the whole of the acid be removed satisfactorily in this way. The best means I found was to dissolve the

crude nitroglucose in a mixture of alcohol and ether, and then to pour this into a large quantity of cold water with constant stirring, and violent agitation afterward. The method is not altogether satisfactory, and seems to be attended with some loss of material, though why, it is not easy to see.

Prepared in this way nitroglucose is a white, lustrous body, which may either assume the doughy amorphous condition, or the crystalline, and passes from one to the other with extreme ease. When first formed by the mixed acids it always has the doughy form. That which I obtained by the use of nitric and sulphuric acid was crystalline from the first. When precipitated by water from its solution in alcohol and ether, it is doughy and almost liquid, and remains so for a long time, if there is any considerable quantity of it.

The best mode of preserving it appears to be under water. By standing thus it gradually hardens, and passes sometimes to a somewhat hard amorphous mass, and sometimes to a granular crystalline state. It appears to be wholly insoluble in water. A few minute grains of the crystalline form diffused through 15 or 20 ounces of water did not dissolve after many hours standing. In a mixture of alcohol and ether it dissolves as easily as sugar in water, and in such quantity as to make the liquid syrupy.

Its detonating properties are but slight. If it be well dried, and a match be applied, it deflagrates with a feeble flash.

It has been stated by Dr. V. Monckhoven that when dissolved in alcohol and kept some time in a warm place, it undergoes decomposition, as evidenced by the fact that the solution then gives an abundant precipitate with nitrate of silver, which at first it did not do. An experiment made in this direction did not give the result thus indicated. A solution of nitroglucose in alcohol, containing about 40 grains to the ounce, was placed in a stoppered vial, and was kept in the sand-bath at a temperature of about blood heat for nearly a month. But neither it nor a fresh solution gave a precipitate with alcoholic solution of nitrate of silver. It would seem from this that certain conditions of temperature or otherwise are necessary, in order that this decomposition should take place.—*American Journal of Science.*

Correspondence.

PHOTOGRAPHIC NOTES ON THE CONTINENT.

[FROM A SPECIAL CORRESPONDENT.]

Nürnberg, 1st August, 1868.

To be transported in forty hours from the hot and noisy Metropolis into the middle of the Thuringian forest, is a change as sudden as it is agreeable. Situated in the centre of Germany, far removed from any town of size or importance, the magnificent scenery of Thuringia with its gigantic forests of beech and pine, stretching out on every side, is little known and rarely visited. And yet the district is one in which Englishmen should feel an interest. The towns of Coburg and Gotha are the principal residences of the Saxe Coburg family, and the palaces of Rosenau and Reichardtbrunn were the birthplace and favourite resort of the late Prince Consort: both of the latter castles are frequently visited by Her Majesty, and are minutely described in "The Early Days of the Prince Consort." Besides these places of interest, Thuringia includes the ancient town of Eisenach, where the princes of Orleans (the descendants and heirs of Louis Philippe) were educated, and the castle of the Wartburg, in which Luther translated the Bible. Thus it would appear that, possessed of both historical and loyal associations, besides being endowed with great natural beauty, the

district requires only to be known to become a place of constant and fashionable resort by the tourists of England.

Eisenach is, perhaps, the most central point of Thuringia, situated on the railway between Frankfort and Leipsic, at the junction of the line from Coburg. Everything in the district is still in a very primitive state, and in the railways one is positively made uncomfortable by the strict regulations posted up in the carriages. You are on no account to lean sideways out of window, nor to press against the door; neither are you to touch the handle of the door, or enter, or descend from, a carriage without the permission of the officers of the Company. Thus when a pretty view strikes you either to the right or the left, the only way of looking at it, if you do not wish to infringe the regulations, is to take a peep out of the corners of your eyes; and as castles, either preserved, or in ruins, surmount almost every hill in a commanding position, the trial to one's feelings is very great indeed.

The universal primitiveness before alluded to is especially noticeable in photography. Neither in Eisenach, Gotha, or Coburg, could I see for sale any pictures taken by the camera of points of interest in the neighbourhood. I wished very much to obtain a picture of the Wartburg, taken, if possible, when I first knew it, some ten years ago, before it had been spoiled (or beautified as the people around call it), for I felt an interest in this remarkable old place, where is still shown, in one of the chambers, the trace on the wall of the ink which Luther threw at the devil. The castle is also the scene of the opera of *Tanhäuser*, and was the residence of the Holy Elizabeth, who, unbeknown to her hard-hearted husband, used to carry up viaticals to the starved out residents in the bourg. On one occasion, when she was caught in the fact by her husband, the latter angrily seized the basket she was carrying and throwing back the cover of the same, discovered nothing more than a cluster of roses; after which, it is said, he never molested her more. In order to purchase a photograph, I entered two or three shops in the town, and on each occasion was shown some three or four dozen prints, but in no single instance were the pictures direct photographs of the objects, but simply copies of engravings. This custom of photographing pictures is one much practised throughout Germany, and is certainly to be deplored, as unskilled purchasers are often misled thereby, the shopkeepers themselves not unfrequently believing in the genuineness of the pictures they sell. It was the same with the pictures of Rosenau and Rheinhardtbrunn; and with panoramas containing series of twenty or thirty sketches of places of interest marked "Photographies de Thuringie," they were all photographs of engravings.

At the town from which I date this letter, photography is practised to a notable extent, but not, in my mind, to the degree it might be done. Nuremberg is *par excellence* a town, noted for its wonderful architecture, its buildings presenting the most varied and beautiful subjects for the camera, and yet of these advantages photographers seem to have availed themselves but partially. The delicate antique stone carving of the various churches and numberless fountains, the frescoes on the public buildings, the quaint gable roofs of the old fashioned houses, together with their overhanging ornamental windows, are subjects essentially suited to photography; and yet, with the exception of some specimens by M. Koenig, of Nuremberg, very few of the beauties of the town are seen produced in the shop windows.

Of the ordinary photographic portraiture produced here I will not speak too critically, as it would be unfair to compare it with that of larger towns, but from the specimens exhibited in the different show-frames, practisers of the art appear to be well represented. No cabinet portraits are to be seen, but some large vignetted heads exhibited in one or two of the studios are deserving of much praise.

Linz, 3rd August, 1868.

Down the Danube from Passau has been a delightful trip. The scenery although very different to that on the Rhine,

certainly equals, if it does not sometimes surpass the same. True there is not that constant succession of lofty hills, each surmounted by a castle, or ruined bourg, nor are there the green sloping vineyards of Rhineland, but on the Danube the mountain walls on each side are higher and clothed in one dense mass of rich foliage which stretching along the steep slopes dips down to the water's edge on either side. The stream twists and turns continually, and sometimes doubles back so completely that a tower which is first seen at the right hand is afterwards observed on the left. The scene is continually changing, and the views obtained are of the most varied character. It seems very strange that so lovely a district should not be as much visited as the Rhine; on the latter river there are as many as eight or ten large steamers passing up and down every day, whereas here one small steamer per diem suffices for the whole of the traffic. What is wanted is a pioneer in the person of a photographer to depict the beauties of the route and to make them well known. The view from the window of the hotel at Linz, where I am at present writing, is certainly more beautiful and extensive than any that can be seen on the Rhine, and would alone repay the trouble of a visit. If Mr. England will direct his steps in this direction next summer and bring his dry plates with him, I will guarantee him as successful and pleasing campaign as that made by him last year on the Rhine.

I continue my journey down the Danube to day as far as Vienna, and will write again on my arrival in that town.

INFORMERS AND PIRACY.—GRAVES v. MERCER.

SIR.—With reference to your report of this case in your valuable Journal, I beg to make a few remarks. It is a significant fact that in a former trial (*Graves v. Ashford*, Mr. Ashford stated just what the defendant in this case states, viz., that the photographs sold by him were of a size differing from the one he was charged with selling, and of which he denied all knowledge.

When evidence is conflicting, probabilities must be considered. At the trial, Mr. Mercer stated that he knew the danger of selling photographs taken from copyright engravings, and had discontinued the practice for some time. He also stated that he knew his customer to be an informer. Under these circumstances it is hardly probable that he would part with a copyright photograph, if he had such a thing in his possession.

The informer, however, must live, and he can only do so by furnishing his employer with the means of obtaining convictions. He therefore buys wherever he can, and when on examining a dealer's stock, he finds no copyrights he solicits the dealer to obtain them for him. Too often the dealer falls into the trap, and is heavily amerced in consequence.

In this case either the informer mistook the identity of the purchase, and planted the photograph amongst those bought, a contingency supposed to be guarded against by having him searched by Cattermole before entering Mr. Mercer's premises.

A man, who to put a dealer off his guard buys hundreds of non-copyright photographs from him, while always asking for illegal goods, is not unlikely to make up a case on finding he cannot otherwise get one.

I do not for a moment suppose that such a proceeding would be approved by the plaintiff, if really committed, but he is open to censure for not clearly ascertaining the *modus operandi* of his staff of informers, and a man who mixes himself up with such men as informers are and must be, notwithstanding their "gentlemanly appearance," must share with them the odium attached to their proceedings, and submit to the rebuke of the Judge and the estimate of the Jury as shown by their verdict.

Dealers not trading in copyrights should know that they have a remedy against informers under the 5th section 11 and 12 Viet. cap. 43, which enacts that any person who shall counsel or procure the commission of any offence punishable on summary conviction shall be liable to be proceeded against and convicted of the same, either together with the principal offender on, before, or after his conviction. Thus informers

counselling the commission of a mis-demeanour render themselves liable to punishment.

Informers are justified in going to a dealer's shop and inspecting what he may have for sale, but on finding that he does not deal in illegal subjects, they have no right to persuade and counsel him to procure and sell such things. In so doing they themselves transgress the law.

Mr. Graves complains of the losses he has sustained by piracy. There is, however, a *per contra* which must act as a partial solatium to him. The heavy fines which have been inflicted have mostly found their way into his pocket, and have to a considerable extent re-imbursed him for his outlay in paying informers.—I remain, sir, yours faithfully, PHOTO.

PHOTOGRAPHY AND DISEASE.

SIR,—Having through illness in the month of February last omitted to read your excellent Journal, I now find, on reading up, an article headed "Photography and Disease," (see page 98, of February 23th.) in which I read complaints from two brother photographers. I have been a practical photographer about twelve years, manipulating daily for about six years without feeling any ill effects from the process. About six years next August, while returning from business, and to all appearances in my usual good health, I was suddenly attacked with a fit in the street which seized me in the left hand and arm and left me senseless on the pavement. Since that time I have had twenty-one more attacks of the same nature, the last being on the 2nd of January, 1868. I feel the same symptoms as your first correspondent exactly. I have been for six years under some of the cleverest medical men I think in London, and all attribute it to poisoned blood from the use of the chemicals, and each advised me to give up the practice of the art altogether. As I am not adapted for anything else, that to me is impossible as at times I can scarcely stand to develop a plate, so I am compelled to practice the art from necessity. With respect to B. B., your second correspondent, my sincere hope is he will give it up ere too late, my feelings after washing prints are exactly the same as he states, but unfortunately I have lost the use of my left arm on three occasions for about seven days each time. A celebrated physician, whose name I should be happy to send any sufferer, told me three years since I must really give it up. I did so at the time, and went in the country for one month, in which time I got considerably stronger, I improved in appetite, and increased ten pounds in weight in twenty-eight days, but was compelled by circumstances to re-enter this profession. I am sorry for the sake of your correspondents I did not see their letters before, but hope it may not be too late to be of some service.—I beg to remain, dear sir, yours most respectfully.

August 2nd, 1868.

A SEVERE SUFFERER.

Talk in the Studio.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.—It may be well to remind our readers that pictures intended for competition at the forthcoming Royal Cornwall Polytechnic Exhibition, should be sent in before the 17th of next month. Forms for filling in, and all other particulars relating to the photographic department, may be obtained of Mr. J. C. Stephens, Falmouth. As our readers know, silver medals are offered for the best portrait and the best landscape, and bronze medals for the second best.

THE AMERICAN BROMIDE PATENT.—The great struggle between American photographers and the owners of the bromide patent is concluded, the patentees are defeated, and the restrictions in the United States on the use of bromides in collodion are at an end. The aim of the patentees was to secure a seven years' renewal of an iniquitous monopoly, and they have striven hard to gain that end. The opposition has been conducted energetically and successfully on behalf of American photographers by our friend Mr. E. L. Wilson, editor of the *Philadelphia Photographer*. The treasurer of the opposition finds that the expenses have been in excess of the funds, but, of

course, photographers will quickly contribute to supply the balance out of pocket.

PHOTOGRAPHS IN EVIDENCE.—In a recent trial for murder at Shrewsbury, a photograph of the murdered man was produced in course of the proceedings for the purpose of identifying him as Mr. Zusman, the person stated to have been murdered. It was ascertained, however, that the photograph was a copy of another portrait in a broach belonging to the deceased's widow. In the absence of direct evidence as to the origin of the broach portrait, the copy was regarded as valueless.

CHLORIDE IN BROMIDE OF POTASSIUM. The Paris correspondent of the *Chemical News*, says:—At a meeting of the Societe de Pharmacie, M. Baudrimont gave an account of "A Process for Detecting the Presence of Chloride in Commercial Bromide of Potassium." The bromide to be examined is first tested for iodine. For this purpose a small quantity of the salt is dissolved in water in a test-tube, and an equal volume of bisulphide of carbon added. Upon the addition of a few drops of bromine water, the bisulphide of carbon becomes coloured violet, under the influence of iodide, if this be present. When the test shows the presence of iodine it is necessary to remove the whole of this element from the sample. This is effected by dissolving about 10 grammes of the salt in distilled water, adding bromine water until violet vapours are no longer visible upon boiling, and then testing for iodine in the manner first described. Afterwards the solution is evaporated to dryness to remove the excess of bromine, and thus one obtains a bromide of potassium free from iodide, but which may contain chloride. The remainder of the process depends upon the fact that a given weight of chloride of potassium requires a much greater amount of a standard solution of nitrate of silver than the same weight of bromide of potassium; while the bromide for the complete precipitation of 1 gramme requires 1.428 grammes of nitrate of silver, 1 gramme of the chloride requires 2.278 grammes. For the examination of the bromide of potassium, a standard solution of nitrate of silver is first prepared by dissolving, in a litre of water, 10 grammes of the pure salt, each 1-10th c.c. corresponding to 1 milligramme of nitrate of silver. 1 gramme of the bromide to be examined, freed from iodine if necessary, is dissolved in 100 c.c. of distilled water: 10 c.c. of this solution, representing 1 gramme of bromide of potassium, would require, if pure, 14.2 c.c. of the silver solution; chloride of potassium would require 22.7 c.c. M. Baudrimont proposes a method of making the final reaction more delicate by adding a few drops of solution of chromate of potash to the bromide examined; the nitrate of silver added then combines with the whole of the bromine and chlorine in preference, and the complete precipitation is marked by the production of the red precipitate of chromate of silver. It is obvious that the bromide contains more or less chloride, according as the number of burette divisions (divided into 1-10th c.c.) of the silver salt required exceeds 14.2. With a salt containing one-tenth of its weight of chloride of potassium 151 divisions are required, and with a mixture of equal weights of chloride and bromide, 185. The same method may be employed to recognize the degree of purity of several compounds. Operating as before—that is to say, dissolving 1 gramme of the material to be examined in 100 c.c. of distilled water, and taking 10 c.c. of the solution—the following numbers of 1-10th c.c. divisions required will show the purity for at least a considerable number of salts:—102 for pure iodide of potassium, 257 for cyanide of potassium, 246 for dry carbonate of potash, 290 for chloride of sodium, 119 for carbonate of soda + 10 equivalents of water, 47 for phosphate of soda + 24 equivalents of water, and 54 for arseniate of soda + 14 equivalents of water.

THE DUKE OF EDINBURGH.—The London Stereoscopic Company have favoured us with an excellent photograph of his Grace the Duke of Edinburgh, which has the especial interest of being the only one taken since the attempt upon his life. The photograph is very excellent indeed.

PHOTOGRAPHY AND LITERATURE.—The *Athenæum*, in reviewing a book on Lake Scenery illustrated with photographs, is severe on the literary portion of the book but complimentary to photography. It says:—"We turn to the illustrations in photography. Here, as the camera is incapable of slang, the glory of nature is displayed. We hope the photographs are to be procured without the text of this book."

THE BEST PHOTOGRAPHERS, Day and Sun.—*Censor*.

To Correspondents.

ALEC.—As we have not tried the sample of collodio-chloride to which you refer we cannot speak with certainty of the preparation, or give the reason for the lack of vigour in your pictures. We may state, however, that want of vigour in collodio-chloride prints is generally due to one of three causes, either there is insufficient free nitrate of silver, insufficient citric acid (or similar body), or the collodion is too thin. Try first adding a little more citric acid; if that does not give you sufficient vigour, try adding a few drops of a saturated aqueous solution of nitrate of silver; and if that does not give sufficient vigour try adding a little more pyroxyline. You will find in our YEAR-BOOK full instructions for preparing collodio-chloride after a formula which gives us excellent results. In general terms the formula stands thus: the plain collodion should contain about 8 grains to the ounce of pyroxyline made by the formula given on page 79 of our YEAR-BOOK. To each ounce of this collodion should be added 15 drops of a solution of nitrate of silver containing a drachm of the nitrate in a drachm of water; 1 drachm of a chloride solution containing 32 grains of chloride of strontium in 1 ounce of water; and $\frac{1}{2}$ drachm of a solution containing 32 grains of citric acid in 1 ounce of water. After mixing, the collodio-chloride may be used in from fifteen to thirty minutes. If you do not make collodion, take almost any good plain negative collodion and add the materials as above.

ENQUIRER.—Bromide of silver is very sparingly soluble in the nitrate solution. The bromide of silver formed on adding bromide of potassium would be precipitated, and the bulk of it will be filtered out. It is probable that you will not find the solution in any way unsuitable for a negative bath. 2. The thin phantom image you describe is most probably due to the collodion, which you state is of your own make. You should also have stated the formula by which it is made, and we could the better have helped you. Newness in the collodion, if good, is a common cause of thinness of the image. Insufficiency of pyroxyline is a common cause. If you have reason to think that your collodion contains sufficient pyroxyline and sufficient of the sensitizing salts, then modifying the developer may help you. Try the gelatino-iron developer. We remember once trying a sample of collodion which gave the then, poor, blue looking image you describe, and we found that the addition of citric acid (1 or 2 grains per ounce) to the iron developer instead of acetic acid materially improved matters. Let us know the result, and if necessary, state the formula of your collodion. You need not apologize for troubling us. It affords us pleasure to assist our readers.

A. CANADIAN.—See answer to ALEC for a formula for preparing collodio-chloride of silver. You will find fuller particulars in our YEAR-BOOK. Any good plain collodion will answer. The nitrate of silver must be added in aqueous solution. A drachm of water will dissolve a drachm of nitrate of silver, and a drop of this solution will contain nearly a grain of nitrate. The chloride and the citric acid are used in alcoholic solution. If you cannot readily procure chloride of strontium, chloride of calcium may be used in its stead. 2. A transparent positive is made in the camera, the image of a negative being made to fall on the sensitive plate instead of an image from an object. You will find instructions in our last YEAR-BOOK on page 73, also in our last volume page 517.

No. 45.—The yellow spots on the print forwarded proceed either from imperfect fixation or from nitrate of silver coming into contact with the print before the hypo was fully removed by washing. They are not the results of grease in the paper, nor are they contagious. The probable cause is imperfect fixation from the use of weak or exhausted hypo, or from the prints sticking in the bath. The result is the formation of insoluble hyposulphite of silver, which, being white, is not noticed at first; it is eventually decomposed by light, sometimes in a few hours, sometimes in a few days, and causes brown and yellow spots.

A SUBSCRIBER (S. Walden).—You will find full details of the Eburneum process in our YEAR-BOOK for 1866.

II. E. W.—We have succeeded with collodio-chloride of silver on many different varieties of paper, our best results having been obtained on the paper prepared with arrowroot for the Wothlytype process. The gelatinized paper of Marion will probably answer well, and we see no reason to doubt the permanency of proofs so produced. The gelatine possibly might, without disadvantage, be rendered insoluble by means of alum. 2. We have used albuminized paper without salt, and obtained good results; but we strongly object to the use of albumen, which, in contact with salts of silver, we believe to be an active cause of instability. To secure any chance of coagulating the albumen on albuminized paper, it

should be floated on boiling water, plain side down; mere immersion will wash off the albumen. 3. Producing collodio-chloride prints on glass, and then transferring them, would doubtless conduce to permanency; and we have obtained some very pleasing results in that way; the chief objection to such a mode would be the trouble involved. We hope shortly to publish some details of operations with some fresh samples of paper.

C. E. F.—It is very probable that the lens you mention may answer the purpose; but we cannot speak with certainty. The new rapid rectilinear will also probably answer. 2. It is probable that adding a trace of gelatine to your developer will be of service, as it will aid in securing even flowing of the developer, and also in slightly retarding the rapidity of its action.

T. H. REDIN.—Thanks for the solution of hyposulphite of ammonia, which we shall take an early opportunity of trying.

J. G.—There is no such memorandum book published. It would probably be found useful. We will make the suggestion to our Publisher.

W. J. A. G.—We believe that none of the Abyssinian photographs have as yet been published. We will ascertain and let you know particulars.

J. H. U. (Sale Green).—Thanks for the photographs duly received. They are exceedingly fine in all respects. Marion (Soho Square) is the only likely firm that we know. We will make some enquiry as to any other firm, and if we learn will let you know. We do not know of any dry process which would yield better results than yours by the collodio-albumen process; very few, indeed, nearly so good.

RECEIVED: THE AMATEUR'S MANUAL OF PHOTOGRAPHY. By Richard Kingham. Fifth edition. Also Specimens of Portraiture by Wm. Notman.

Several Correspondents in our next.

Photographs Registered.

Mr. BARREACLOUGH, Scarborough,
Photograph of D. J. Fox, Esq.

Mr. R. SLINGSBY, Lincoln,
Photograph of Broad Tower, Lincoln Cathedral.

Mr. W. WALTON, Kensington,
Eight Photographs of Mr. F. Neville in various characters.
Nine Photographs of Arthur Lloyd in various characters.

Mr. C. MASON, Camelford,
Photograph of Rev. J. J. Wilkinson.
Photograph of Rev. Oliver Beckerley.

Mr. J. LAING, Shrewsbury,
Photograph of St. Mary's Church.

Mr. THOS. BENNETT, Worcester,
Sixteen Photographs of Clergymen.
Photograph of — Hunt, Esq.

MESSRS. APPLETON AND CO., Bradford,
Photograph of Rev J. Lomas.

Mr. BRADREE, Torquay,
Photograph of Rev. Joseph Bardsley.
Three photographs of Rev. Joseph Bardsley (busts)

Mr. HOGGARD, Redcar,
Two photographs of Middleboro' Exchange.

Mr J. V. HATCH, Huddersfield,
Photograph of "Cherry Tree Inn" Huddersfield.

* * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

All Communications for the Editor to be addressed to 15 Gough Square, Fleet Street, London, E.C.

All communications respecting advertisements to be addressed to the PUBLISHERS, MESSRS. PIPER and CARTER, 15, Gough Square, Fleet Street, London, E.C.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 519. — August 14, 1868.

CONTENTS.

	PAGE
The New Act to Regulate the Sale of Poisons	385
Photography for Facsimile	386
The Kinescope	386
The Late M. Claudet	387
Reduction of the Sesqui-Salts of Iron to Protosalts	388
Chloro-Iodized Collodion	388
Method of Mounting Photographs and Engravings	389
Actinic Value of Colour in Negatives. By M. Carey Lea	389
Photo-Block Printing	389
Pictorial Effect in Photography. By H. P. Robinson	390

	PAGE
On the Measurement of the Luminous Intensity of Light. By William Crookes, F.R.S., etc.	391
On Some New Experiments on Light. By J. H. Gladstone, Ph.D., F.R.S.	393
Proceedings of Societies—Photographic Society of Marseilles	
Correspondence—Photographic Notes on the Continent	
Talk in the Studio	
To Correspondents	
Registration of Photographs	

THE NEW ACT TO REGULATE THE SALE OF POISONS.

An act has just been passed to regulate the sale of poisons and amend the Pharmacy Act of 1852, the provisions of the new Act materially affecting the convenience of photographers and vitally concerning all photographic dealers. By the provisions of the new act it becomes unlawful for any person except a registered pharmaceutical chemist, to retail certain poisons scheduled in the act. The poisons so mentioned, which concern photographers, are cyanide of potassium and other metallic cyanides, corrosive sublimate (bichloride of mercury), oxalic acid, and chloroform, the latter necessarily comprehending amber and other varnishes of which the solvent is chloroform. The penalty incurred by every unqualified person who shall retail any of these poisons is five pounds for each offence.

The qualifications of a pharmaceutical chemist, the examination he must pass, and the registration requisite, are all duly set forth in the present act and in the pharmacy act which is amended by the present enactments, and need not be repeated here, as not concerning the general body of our readers. Pharmaceutical chemists, moreover, may not sell the poisons scheduled except under the most stringent and guarded conditions.

The qualified seller will be liable to penalties unless the box, bottle, vessel, wrapper or cover in which the poison is contained, be distinctly labelled with the name of the article and the word "Poison," and with the name and address of the seller of the poison. In regard to certain poisons the qualified seller must not supply any person unknown to him, unless introduced by some person known to him; and on every sale of any such article the seller must, before delivery, make an entry in a book to be kept for that purpose, stating, in the form provided, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, the signature of the purchaser and of the person, if any, who introduced him to be affixed to the entry.

The convenience of photographers will be somewhat affected by the act, but photographic dealers are most concerned, not so much, perhaps, by the loss of profits on the articles in question as by the annoyance involved in being unable to complete orders, and the multiplicity of explanations and disappointments involved. Some months ago, during the progress of this bill, we called the attention of those concerned to the possible restrictions on trade which such an act would impose, but, so far as we can learn, the interests of those using various of the articles mentioned for industrial purposes have not been considered. Singularly enough, the makers and vendors of patent medicines are exempted from the operations of the act, and such an excep-

tion having been made, we can scarcely suppose that a similar exemption might not have been secured to vendors for industrial purposes, if the case had been duly represented to the promoters of the bill in committee. As the matter stands the act will have a tendency, probably, to restrict the use, in photography, of cyanide, and also of mercury, neither of which are necessary, and the abolition of which from studios generally will probably do more good than harm.

We append some extracts from the Act which does not come into operation until the 31st of December in the present year, permitting, therefore, plenty of time to photographers who still desire to use such things to lay in a supply, and at the same time allowing the dealers generally to get rid of the stock in hand, which it is desirable they should effect before the date in question. The following are clauses of interest to our readers:—

From and after the thirty-first of December, one thousand eight hundred and sixty-eight, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title "chemist and druggist," or chemist or druggist, or pharmacist, or dispensing chemist or druggist, in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or a chemist and druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council.

The several articles named or described in the schedule (A.) shall be deemed to be poisons within the meaning of this act, and the Council of the Pharmaceutical Society of Great Britain (hereinafter referred to as the Pharmaceutical Society) may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison within the meaning of this Act; and thereupon the said Society shall submit the same for the approval of the Privy Council, and if such approval shall be given, then such resolution and approval shall be advertised in the *London Gazette*, and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act.

Several clauses, as the qualification, registration, &c., of pharmaceutical chemists follow, and the Act then proceeds:—

Nothing herein-before contained shall extend to or interfere with the business of any legally qualified apothecary or of any member of the Royal College of Veterinary Surgeons of Great Britain, nor with the making or dealing in patent medicines, nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing; and upon the decease of any pharmaceutical chemist, or chemist and druggist actually in business at the time of his death it shall be lawful for any executor, administrator, or trustee of the estate of such pharmaceutical chemist or chemist and druggist to continue such business if and so long only as such business shall be *bona fide* conducted by a duly qualified assistant, and a duly qualified assistant within the meaning of this clause shall be a pharmaceutical chemist or a chemist and druggist registered by the registrar under the Pharmacy Act or this Act; provided always that registration under this Act shall not entitle any person so registered to practise medicine or surgery, or any branch of medicine or surgery.

It shall be unlawful to sell any poison, either by wholesale or by

retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison of those which are in the first part of Schedule (A.) to this Act, or may hereafter be added thereto under section two of this Act, to any person unknown to the seller, unless introduced by some person known to the seller; and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating, in the form set forth in Schedule (F.) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him shall be affixed; and any person selling poison otherwise than is herein provided shall, upon a summary conviction before two justices of the peace in England, or sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence. And for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller; but the provisions of this section, which are solely applicable to poisons in the first part of the Schedule (A.) to this Act, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act; provided such medicine be labelled in the manner aforesaid, with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose. And nothing in this Act contained shall repeal or affect any of the provisions of an Act of the session holden in the fourteenth and fifteenth years in the reign of Her present Majesty, intitled An Act to Regulate the Sale of Arsenic.

SCHEDULE (A.)—PART I.

Arsenic and its preparations.

Prussic acid.

Cyanides of potassium and all metallic cyanides.

Strychnine and all poisonous vegetable alkaloids and their salts.

Aconite and its preparations.

Emetic tartar.

Corrosive sublimate,

Cantharides.

Savin and its oil.

Ergot of rye and its preparations.

PART 2.

Oxalic acid.

Chloroform.

Belladonna and its preparations.

Essential oil of almonds, unless deprived of its prussic acid.

Opium and all preparations of opium or of poppies.

PHOTOGRAPHY FOR FACSIMILE.

We have had opportunity recently to assist in a somewhat interesting application of photography as a means of aiding in comparison and identification of documents. Many of our readers are aware of the recent discovery of an unprinted poem supposed to be Milton's. Mr. Henry Morley, Professor of English Literature at London University, in the course of compiling a volume of Puritan poems, examined a volume of Milton's minor poems, dated 1645, in the King's Library at the British Museum, written on the fly-leaf of which he found a manuscript poem entitled "An Epitaph," signed J. M., and dated 1647. The style of thought and expression, and the character of the metre, struck him as essentially Miltonic, and he communicated to the *Times* his discovery of what he believed to be an unknown poem by Milton. Straightway a hot controversy arose as to the probability of the poem having been written by Milton. The matter and manner were fiercely attacked and ably defended. The similarity of the handwriting to that of Milton's was denied and re-affirmed, the signature was doubted and defended, and the daily press and the critical weekly press were kept for some weeks in a state of excitement over the discussion.

Any discussion of the literary question would be out of

place in these pages, and we pass by that part of the question by merely remarking that much of the thought and expression are strikingly like, and not unworthy of, Milton. But there is a phase of the question which will interest photographers. Original MSS. in the handwriting of Milton are not plentiful. The authentic examples in the British Museum chiefly consist of fragments or signatures, which do not afford very extensive facility for comparison. Sotheby's *Fac-Similes* afford more scope; but these are, at best, but the imitations of a clever copyist, and, in some instances which we have noticed, fail to reproduce quite accurately the originals. There is, however, in the Library of Trinity College at Cambridge, a fine collection of Milton's original manuscripts, which must manifestly afford the most valuable aids to comparison. But here arises the difficulty: the treasures of Cambridge cannot with propriety leave the Library at Trinity, nor can the British Museum with more propriety permit a rare and valuable book to pass out of its custody. The two manuscripts cannot be brought together, but here photography steps in to solve the difficulty. The authorities of the Museum accorded to Mr. Hain Friswell, the Editor of the "Bayard Series," on which Mr. Morley was engaged, permission to photograph the recently discovered poem, and under this authority an excellent copy of the poem was produced by Mr. Blanchard.

We were entrusted by Mr. Friswell with an early proof of the negative for comparison with the MSS. at Cambridge, and by the courtesy, and with the assistance, of the Master of Trinity, we were enabled to make a careful comparison. It is difficult, perhaps, in a case of this kind to arrive at certainty. Strong probability is as much as can be looked for. Allowing for the somewhat cramped style and diminutive size rendered necessary in completing a given number of lines within the limited space of the blank leaf of a small book, the handwriting in the new poem and that in the Cambridge MSS. was strikingly alike, the resemblance being most marked to poems in the Cambridge MSS. near the date of the recently discovered "Epitaph." The Cambridge MSS. extended over a period of more than twelve years; but the writing in a poem dated 1646, presents the strongest points of similarity, the formation of the figures of the date being precisely the same as the formation of the figures in the date of the "Epitaph." Not only did we find a similarity in the general style of writing, but an absolute identity in many points of distinctive peculiarity in the form of both capitals and small letters, in spelling, and in words of contraction or abbreviation. The capitals, especially in Milton, are unusual in form, and resemble rather the printed italic capitals now in use than the letters with curved and flowing lines of written letters. We have not space here, and it might not interest all of our readers, to enter into minute detail as to the character of individual letters. Suffice it to say, that the experiment proved a strikingly satisfactory illustration of the value of photography for facsimile as superior to any other method which could possibly be adopted.

A photo-lithographic facsimile, produced by Mr. Ayling from Mr. Blanchard's negative, will be published in the volume of poems shortly to be issued, and some notes on the results of the comparison for which facility was afforded by photography.

THE KINESCOPE.

We have recently received from M. Roman Talbot a pretty little optical toy, in which a curious and interesting application of photography is made. It is practically a miniature illustration of the principle of persistence of vision upon which the effects of moving figures are obtained in the thaumatrope, the zoetrope, &c. The kinescope is in the form of a handsome oval locket with ring to be worn attached to a watch chain. It contains two microscopic transparent photographs, placed opposite a minute Stanhope lens. The two photographs are of the same object in a

different position, and represents two successive phases of one action. On looking through the small aperture at first nothing is seen but a fine magnified image of a transparent photograph. But on pressing a small button the first image disappears and a second fills its place with such rapidity as to produce on the retina the effect of motion in the figure. Thus in the example before us the first photograph gives a group of two figures, a young lady, and a young gentleman leaning over her chair, the lady listening very demurely apparently to the gentleman's conversation. The button is touched, and straightway the gentleman is seen to kiss the lady—respectfully of course, and on the forehead—her head being in turn lifted to receive the kiss. On alternately pressing and releasing the button, the gentleman is seen to repeat the salute with rapidity and *empressment*. This is of course but one effect of many representations of objects in motion which may be produced. The photographs are excellent, and an effect of great solidity is produced. This is another illustration of our recent remarks on the ingenuity with which our continental neighbours are constantly making ingenious, and often, we believe, remunerative, applications of the art.

THE LATE M. CLAUDET.*

As a science, and as an art, photography embraces a very wide range of study and experiment, and it has generally happened that its votaries have devoted themselves to some one of the many phases of interest it possesses. To some its especial interest has consisted in the subtle problems it has presented to chemical or optical science, and the stimulus to research in new directions in connection therewith; whilst to others its chief interest has consisted in the facility with which it lent itself to pictorial purposes, and the rare truth and beauty of its results. M. Claudet was singularly complete and universal in his devotion to photography; he was equally enthusiastic in regard to its scientific, mechanical, and artistic developments, some of his most recent experiments having been devoted to the perfection of an ingenious mechanical contrivance, by which he hoped to diffuse definition and secure more artistic qualities in portraiture. His biographer says:—

Yet, whilst we point to Claudet as a philosopher, it would be less than justice not to recognize his ability as an artist, and his great services to the art of photography. He not only himself produced beautiful and perfect works in photography, but was also eminently, by his studies and inventions, the means of enabling others to refine and advance the art. He was, indeed, the champion of photography as an art. When the managers of the Universal Exhibition of 1862 had placed photography in the mechanical department, he emerged from the laboratory into the studio, and, lined in rest, chivalrously proclaimed photography one of the fine arts against all comers. "I am one of those," he says, in one of his printed letters of that date, "who are convinced that photography deserves to be ranked among the fine arts. If photography was only a machine, such as a magic lantern, with which every one can strike pictures on a white screen with the same success, its productions might indeed be exhibited in the mechanical department; but as I find from my own experience, which is as old as photography itself, that nothing is more difficult than to produce photographs deserving to be looked at—that it requires thought, taste, judgment, and refinement to use with success the apparatus and the process—I consider that there is as much art in the result as in any of the so-called fine arts."

Some space is next devoted to recent correspondence between M. Claudet and Sir David Brewster, in regard to the favourite notions of the latter as to the importance of small lenses. Some extracts from his letters to M. Claudet may be interesting here:—

March 22, 1867.—I am persuaded that the great desideratum in photography, whether monocular or binocular, is the *perfection of the picture*, in the camera. I am certain that different cameras, even when the lenses are corrected for colour and aberration, do not give the same likeness.

This imperfection obviously arises from the different apertures of the lens, in a great measure; but I believe, also, from the number and form of the separate lenses.

An infinitely small pin-hole is the most perfect camera, and the nearer we can approach to the smallest and thinnest lens, the nearer do we approach to a perfect portrait.

The extreme sensitiveness of the process enables the photographer to reduce his lens to the size of the human pupil, which is absolutely necessary to produce the portrait of the person whom we actually see, but something also depends on the perfect homogeneity of the glass employed, and of the number and curvature of the refracting surfaces.

No proper experiment has yet been made to ascertain the effect of a single lens of diamond or any other substance. I wish you would enter upon this inquiry. You are the only person I know fitted to do it.

April 18, 1867.—I have no doubt that with your knowledge, theoretical and practical, you will give a new character to photographic portraiture.

I think the two great points to be attended to are: 1. The smallness of the aperture of the lens; and 2. The simplicity of the optical apparatus, the smallest thickness of the refracting material, and the smallest number of refracting surfaces.

I do not think *sharp definition* at all necessary; on the contrary, I think it an evil.

In society I see faces, and every expression upon them with sufficient distinctness, notwithstanding my long-sighted vision. When I put on glasses to have perfect vision, the very distinct picture, even of the youngest and smoothest faces, is disagreeable, while that of middle-aged and old persons is still more so. Beauty, either of form or expression, is injured by sharpness of outline; and the vision of minute parts, and the corrugations and wrinkles of age, and even of middle life, are made doubly disagreeable.

Has it ever occurred to you that a large lens, perfectly achromatic and without spherical aberration, cannot give a correct representation even of a *perfectly flat space*, such as the breadth of a line?

I shall be glad to read the papers you mention, which I hope will soon be published.

June 3, 1867.—I am delighted with the result of the topaz experiment; the portrait is singularly fine. The dispersive power of topaz is 0.024, that of crown glass being 0.033, and that of flint glass 0.048. To have the smallest aberration, the side of the lens with its flatter surface should be next the image, the aberration in this case being 1, and the aberration in the other case 4, so that your excellent effect has been produced *with the largest aberration*. This seems to throw a new light on the subject. The lens had thus a great number of foci, a number increased by the number of chromatic foci, and hence the *excellence of the picture*. It is easy to increase the number of foci by increasing the size of the lens, but then you introduce the error arising from the superposition of different views of the figure, as seen from different points of the lens.

If these views are correct, it would be worth while to try a lens of *flint glass*, with various chromatic and actinic foci, and with the radii of its surface as 1 to 6 (a plano-convex nearly), having its flattest side towards the sitter. It will be curious if we find that the lens which is the worst for the telescope and the microscope should be the best for taking the picture of a solid object, such as the human figure. * * *

I wish you would try some experiments with the largest lens you have in your cameras, and take five pictures of a large statue, one from half an inch of its centre, one from the lowest point, one from the highest part of its circumference, and one from its left and right. This would show clearly the effect produced by the size of the lens.

If the experiment were made upon a living figure, the change of expression would be seen. It would be also very interesting to take a photograph of the same statue with a small pinhole.

August 20, 1867.—I cannot resist thanking you for your interesting letter and its enclosures.

Your portrait by the topaz lens is *perfect*. Nothing can surpass it, and it is hardly necessary for you to try the one-fourth of an inch aperture. It might be worth while to try three-fourths of an inch, which will reduce more than one-half the time of sitting.

It is not necessary here to discuss the question of small lenses of long focus, the adoption of which, even if the results were desirable, would be practically impossible in portraiture. A copy of the portrait by the topaz lens has been kindly promised by Mr. Henry Claudet to each member of the Photographic Society, and many photographers will thus acquire an opportunity of examining the results Sir David Brewster thought so perfect. On the subject of wide apertures, M. Claudet, writing to Sir David, says:—

"In order to prove the defects of operating with large apertures in lenses, I operated in the following manner:—I had a disc of the same size as the lens (5-inch), having on its diameter an aperture of 1 inch, which could at will be turned alternately to the right or left of the horizontal line corresponding with the diameter of the lens. Having taken a portrait with the aperture on one side the diaphragm

* Continued from p. 373.

was turned so as to present the opening on the other side, and then a second portrait was taken before the sitter had moved."

"The result of this experiment is very conclusive, for the two portraits being examined with a stereoscope, present the strongest stereoscopic effect which can be obtained by the usual mode of operating."

The latter sentence in the paragraph just quoted in reality disposes of Sir David's argument. He believed that a portrait to be correctly delineated should not be produced with an aperture larger than the pupil of the human eye, over-looking, apparently, the fact that two eyes are employed, and that to secure some approximation to the relief and solidity of nature a much larger aperture should be used in the lens, when objects in relief have to be depicted on a flat surface. It is worth noting here, also, that from the letter of Sir David, dated June 3, 1867, it appears to have been a new idea to him that diffusion of definition in rendering solid objects could be obtained by lenses having a series of foci at different planes, or, in other words, by using lenses in which a certain amount of aberration was purposely left uncorrected, a practice the value of which for certain purposes we have pressed upon the attention of our readers for many years.

We conclude by extracting some eloquent paragraphs on the general character and labours of M. Claudet:—

In 1851, Claudet set up a temple to photography after his own heart. Here, in the Hall of Audience, could he be consulted at call from the *adytum sanctum*. Here, surrounded by symbols and examples, the neophyte was impressed with the dignity and beauty of photography; perhaps first learned that photography is an outcome of the labours of philosophers through the ages of civilisation. For he saw, on glancing at the medallion portraits around the cove, names of men now thought of as ancients—Roger Bacon, Porta, Da Vinci, Newton—and was reminded of the honour due to many nearer to his own time, as Davy, Wedgwood, Niepce, Daguerre, Talbot, Wheatstone, Brewster, Arago. He saw described by allegorical paintings the progress of the arts by which natural objects and the human form have been represented from the earliest time—statuary, painting, application of the camera obscura to photography and of photography to the stereoscope, emblems of the discovery of photography and of the means of producing photographic pictures, mural scrolls, chronological records of the inventions and discoveries whereunto photography is indebted; or, looking again, he read inscriptions of the classic testimony of Virgil or Martial: "*Nulla recedunt lux est ingrata*," "*Solem quis dicere fulsum audeat?*" "*Lux est mundi lumen*." All this is to be seen no more. This temple, so characteristic of Claudet's devotion to photography, was burnt a few weeks after its chief priest had quitted it for ever. With it were lost many beautiful works and valuable relics of the master's labours.

But, as we have elsewhere said, that for which Claudet deserves best to be remembered is of such a fabric as fire cannot destroy. He has left his impress upon science—a gap in the ranks. Like all men of original thought, he will be followed, not replaced. Those who haunt the groves of science will miss his familiar form, and listen in vain for his instructive lucubrations. For he was of the order of the Peripatetics. Whether at the Royal Society, or at photographic confederations in England or Scotland, or at universal exhibitions—wheresoever the British Association wandered, there was he seen and heard; or whether in the *Philosophical Transactions*, or in the *Comptes Rendus*, or in photographic journals, or in art journals—wherever photography had to be expounded or vindicated, there would be found the product of his pen. His activity was incessant, his motto that of Pascal: "*Le repos c'est la mort*."

Nor would we conclude a memoir of Claudet without indication of his personal qualities. That he was of a generous temperament, liberal and genial, is indeed partly implied by what has been previously said of his enthusiasm. It was so. He was "one of nature's gentlemen." Unselfish, he allowed the interests of science to overrule all meaner considerations, and with the true sentiment of the philosopher, subdued all things to the purpose of investigating the recondite principles of nature's laws. This was his adoration: "*Est Deus in nobis, est Deus in rebus*." Whatever his toils or his disappointments, he was not discouraged. "He that seeketh to be eminent amongst able men hath a great task," says Bacon, and with such a task Claudet was contented. He was one who had set himself to answer the insatiate Sphinx, not expecting the success of Odipus, willing to die in the encounter. For with him it was truly a "labour of love." Science was the mistress of his heart, a sweet echo ever responsive to his constant call. And so he found solace in—

"Divine philosophy,
Not harsh and crabbed as dull fools suppose,
But musical as is Apollo's lute,
And a perpetual feast of nectared sweets,
Where no crude surfeit reigns."

The recognition of Claudet's merits in his lifetime was perhaps sufficient to satisfy a man who sought only such honour. He received awards of eleven medals, including the Council Medals of the Universal Exhibition, 1851, besides that on other great occasions, being on juries, he was excluded from the awards. He was elected member of the Royal Society in 1853, and in 1865 he was made a Chevalier of the Legion of Honour. But of such was not his ambition. He was a votary to science, and wrought chiefly to feed her altar-flame. For him that was enough.

"*Recte facti, fecisse merces est.*"

REDUCTION OF THE SESQUI-SALTS OF IRON TO PROTOSALTS.

Mr. W. J. LAND contributes to our excellent contemporary the *Philadelphia Photographer*, a simple method of converting the persalts of iron to the protosalts by means of nascent hydrogen. As it sometimes happens that large stocks of iron solution become peroxidized, the method may be found useful by photographers. He says:—

"While engaged in the analysis of nitrates by M. Pelonze's method, I find that solutions of persalts of iron are perfectly reduced to protosalts by nascent hydrogen. As I do not remember to have seen a record of such reduction of ferric salts (in solution), I am induced to offer this, hoping that something useful may result from it, either by its application in analysis of iron salts, or to the restoration of developers, &c. The following will serve as an example of the experiment, which may be modified in various ways:— If to a solution of persulphate of iron, a small quantity of sulphuric acid and iron filings are added, an elimination of hydrogen will take place, but the greater part of the gas at the moment of liberation unites with the oxygen of the persalt, and in a short time reduces it to protosulphate, in which no trace of a higher iron-salt can be found. The experiment is best made in a flask with a small neck, loosely stopped; and, if the solution is to be tested for persalt, the flask should be fitted with a valve opening outward. The temperature should be raised that the perfect expulsion of the atmosphere may be affected, the oxygen of which would quickly peroxidize some of the reduced salt. I have experimented upon the mineral acid salts of iron. The organic acid salts would probably undergo like reduction with the proper material for generating hydrogen in their solutions."

CHLORO-IODIZED COLLODION.

Mr. F. M. Spencer says in the *Philadelphia Photographer*:—"I find the following to make a collodion even more sensitive than any bromized collodion I have ever used. I am indebted to Professor Towler for the idea mainly. I substituted chloride of magnesium for chloride of ammonium, as suggested by him.

Ether and alcohol	...	...	equal parts
Iodide of ammonium	..	...	3 grs. to the oz.
Iodide of cadmium	...	...	2 " " "
Chloride of magnesium	...	...	1 gr. " "
Pyroxyline	...	...	5 to 6 grs. " "

"I dissolve the salts in the alcohol, add the cotton, and then the ether.

"I use a forty-grain silver bath, kept as nearly as possible in harmony with the condition of my collodion—generally neutral, but if my collodion be slightly alkaline, I had rather the bath be so too, than to be the least bit acid. I think any operator who will give this collodion a fair trial, will be pleased with it. I never have to doctor my bath, except when it becomes overcharged with alcohol which I drive off by boiling. Or if I find my bath overcharged with iodide of silver, I add a few drops of a strong solution of cyanuret of potassium. Shake and filter. In short, with a chloro-iodized collodion, I consider the most difficult points in in-door photography to be lighting the subject and managing the development.

METHOD OF MOUNTING PHOTOGRAPHS AND ENGRAVINGS.

The following method of mounting photographic and other pictures produced upon paper has been patented in America:—

"Take any substance that affords a plain and even surface, and can be enamelled or painted white, whether it be paper, glass, china, or any form of earthenware, wood, stone, or metal, and having made the surface white and smooth, by enamelling, painting, or other process, and cover it with a mixture of clarified beeswax, balsam of fir, and spirits of turpentine, mixed in about equal parts, softened by heat to such consistency that it will readily flow over and off the surface, leaving a thin film remaining. The picture to be mounted, which may be an ordinary photograph, taken and finished in the usual manner, or an engraving, is then rendered translucent, by the application of wax, varnish, or other suitable substance. Before the film of beeswax, balsam, and spirits of turpentine hardens, the picture is placed upon the surface of the film, and pressed gently upon it, or, should it have hardened, it is softened by the heat of a spirit-lamp, and when sufficiently soft, the picture laid upon it, and by the application of an even and gentle pressure, it soon becomes fixed. The picture, after being thus mounted and revarnished, is then ready for colouring, which is done in any of the ordinary methods.

"It is evident that the tint or colour of the background will influence the appearance and tone of the picture, and therefore affords a means of cheaply producing a wide range of artistic and beautiful effects."

ACTINIC VALUE OF COLOUR IN NEGATIVES.

BY M. CAREY LEA.*

In working with any sort of dry or preserved plates, we are met by a difficulty which does not occur with wet ones. Instead of the silver-gray colour of the wet plate, we have to do with every possible shade of colour (the expression is not exaggerated, as will presently be seen), and the estimation of the effect of transparency or opacity to the chemical rays of light is a question of vital importance to the photographer. I do not pretend to be able to give rules for its solution, rather feeling disposed to echo the wish of an English photographer for a pair of "actinic spectacles," to enable one to estimate the value of these shades. But even where a satisfactory solution is not to be expected, a survey of the difficulty is always useful.

The colour of the film in a dry plate seems to have very much less to do with its actinic value than could at all be imagined. For example, I have a negative taken by the glycerine process, in which the sky is deep blood red. Such a shade is commonly known as very opaque to the chemical rays, yet the sky "prints through" more than any other negative that I have taken, within my recollection, and more than other negatives with lighter looking skies taken by the same process. It should be mentioned that no part of this negative is very dense, so that the sky printing through cannot be ascribed to anything in the way of a long exposure necessitated by an otherwise dense negative.

On the other hand, some time since I made two negatives, also by the glycerine process. In both the distance consists of trees about a quarter of a mile off. The foliage was dense and dark green, and no sun upon it—the day was overcast with rather thick clouds. The distant foliage in question came out in developing of a well-marked bluish colour. In view of this and of apparent thinness, I expected them to print too black; in place of which, this blue portion proved so opaque that the difficulty was the other way. It should be said that this blue was perfectly so without any tint of green or olive to explain its behaviour.

The opacity to light of the olive colour in many of the

plates developed according to the alkali process is very remarkable. Every one who writes on the subject very properly warns his readers of the danger, and yet I doubt if any one learns the lesson fairly except by experience. Negatives that look beautifully graduated as to colour may print hard and flat for this reason, and considerable experience is required to know when to stop the development, in order to get the best results. Distant trees, if strongly illuminated, may show a strong contrast with the sky when seen with the eye, by holding up to the window, and yet, on printing, these trees may almost shade out into the clouds or sky above.

When negatives by the glycerine process are developed with iron, the most extraordinary diversities of colour result. Sometimes the plates exactly resemble wet plates developed by iron, have the same silver-gray colour and creamy look, and sometimes show well as positives by reflected light. Oftener, especially when the exposure has been long enough to dispense with anything in the way of redevelopment, the image is entirely within the film. Its surface is then hard and glossy, and it is in these cases, especially when there has been a little over-exposure, that the remarkable effects of colour come in.

I have several negatives, in each of which the following triple play of colours comes in:—

First, if they be viewed against a dark background by reflected light, but by diffused reflected light, and not catching the reflection of a sky through a window, then the skies in the negatives are deep blue, very intense—so are their reflections from the surface of water. The grass and foliage is pale-green—so, also, is its reflection in the water, except where the foliage is highly illuminated—in such places its colour is as blue, nearly, as the sky.

If the reflection of the sky, as seen through a window, be caught, these colours disappear, and all the high lights, and even middle tones, have a yellow, brassy, metallic look on a neutral ground.

Held up against the sky, and viewed by transmitted light, the whole negative is brownish-red, except some over-exposed branches of a tree; these are blue by transmitted light.

All this colouration has resisted fixing by hyposulphite of soda, and is easily distinguishable. Although it seems a step towards heliochromy, the effected is simply curious, and not in the least pleasing.

Blue, in glycerine plates, is not at all an uncommon colour, both by reflected and transmitted light. But, it is to be remarked, that the same portion of the plate is never, it would seem, blue by both reflected and transmitted light. The blues, by reflected light are dark brown by transmitted, and the portions that are blue by transmitted light are not so by reflected.

The very same plates that give these varied colours, when developed by iron, give plain black when pyrogallie acid is used for developing. Solarized portions, upon which the light has been too strong, develop red by the iron developer; black, or sometimes dark-olive, with pyrogallie acid.

This suggests the idea that in the study of heliochromy more attention is probably needed to the forms of development, and less to the sensitive agent, than has been given.

PHOTO-BLOCK PRINTING.

The economic value of a method of producing, by means of photography, surface printing blocks which may be used with ordinary types cannot be over-estimated. Experimentalists have been alive to the value of such a process for many years, and numerous attempts have been made to compass the desired end. The early experiments of M. Paul Pretsch possessed much excellence, but like too many of his efforts in photo-engraving did not meet with the success which their ingenuity and the persevering zeal of the experimentalist deserved. Mr. Dallas, Mr. Hancock, and others have worked

* *Philadelphia Photographer.*

with considerable success, so far as we can judge from the examples we have seen, in the same direction, but as yet their processes have not received any extended commercial application. Mr. Griggs has worked with some success in the same groove, an example of his work having recently appeared in our pages. We have had for some months in our possession, waiting until we had space to devote to the subject, a fine example of photo-relief engraving by Mr. Swan, and another block, produced by an analogous process, received from Dr. Vogel of Berlin. We hope shortly to find space to place these illustrations of processes before our readers.

A few days ago we were favoured by Mr. D. Fruwirth with some fine examples of photo-lithography and photo-block printing, by processes which he has recently patented. The processes in their general character are, we understand, due to Mr. Courtenay, modifications and improvements only being claimed by Mr. Fruwirth. It is with the block-printing we have to do at present. It is based upon the known re-action of light upon gelatine and a chromic salt, the speciality here depending upon a combination of the glyphotographic process with a photo-engraving process. The operations may be briefly stated as follows:—A good negative is first obtained—always, be it understood, a reproduction of a subject possessing the mechanical gradation of stipple or line—under this negative a plate coated with gelatine and bichromate is exposed, and the insoluble portions are subsequently washed away, leaving the whites of the image in relief. From this relief a cast in plaster is taken, and from the plaster cast another cast in type-metal is obtained. It is here that care is required, and facility for improvements upon old processes arises. It rarely happens that the relief in the gelatine mould is sufficient to yield a good printing block, the recesses not being sufficiently deep. In ordinary press printing the paper is backed by a soft elastic surface, and if the recesses are not deep the paper is pressed into them, and a muddy unclear image is the result. In the glyphotographic processes broad spaces are easily built up on the

usual way. In this stereo cast it will be observed that the lines in relief will form the recesses in an electro block obtained from it, and the mode of treatment we have described will secure, it is understood, sufficient depth in the recesses to permit clean printing. Amongst the examples to which Mr. Fruwirth called our attention were some blocks as large as a page of this Journal. The demands upon our space only permit us, however, to insert here a small illustration, which besides possessing greater delicacy, also permits to many of our readers facility for comparison, being one of Kaulbachs celebrated illustrations to "Reynard the Fox." It is probable that when we have space or occasion we shall place further examples before our readers.

At present we can see no valid reason why processes of photo-block printing for reproduction of engravings or of drawings made in line for the purpose should not receive a much wider economic application than they have yet done; but it is a singular fact, that hitherto almost all attempts to supersede wood-engraving, from photo-engraving down to graphotype, have failed either of commercial or artistic success, or of both. We hope for the method under notice a better issue.

We may add, that besides some very good photo-lithographs in line, Mr. Fruwirth showed us some of the most perfect photo-lithographs in half tone we have yet seen, and possessing very high promise indeed. As the process will be patented, and the specification is not fully entered, we cannot enter into the details of the process at present.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXIX.

"Nature is always broad; and if you paint her colours in true relations, you will paint them in majestic masses. If you find your work look broken and scattered, it is, in all probability, not only ill composed but untrue."—*Ruskin.*

CHIAROSCURO—(continued).—BREADTH.

WHATEVER arrangement or system of chiaroscuro is employed in a picture it must have breadth of effect, without which the eye will never rest upon it with pleasure. Just as a degree of irritation to the touch arises from uneven surfaces so all lights and shades which are interrupted and scattered are more irritating than those which are broad and continued. It must not be supposed from this that extreme contrast of light and shade in the proper quantity, and in the right place, is not agreeable, for upon contrast and opposition, as I have already shown, much of pictorial effect depends, but it is the flickering lights and perpetually shifting glare of ill-managed chiaroscuro that keep the eye in a state of constant irritation, and distracts the attention from the subject of the picture. The effect to be avoided is that which Milton described before his weak and easily affected eyes had lost their light, when he wrote—

"Hide me from day's garish eye,
When the sun begins to fling
His flaring beams."

In an endeavour to explain the cause of the beautiful effect of breadth as seen in twilight, an admirable writer says:—"It may, perhaps, be said that the imagination, from a few imperfect hints, often forms beauties which have no existence, and that indifference may naturally arise from those phantoms not being realized. I am far from denying the power of partial concealment and obscurity on the imagination, but in these cases the set of objects when seen by twilight is beautiful as a picture, and would appear highly so if exactly represented on the canvas; but in full daylight, the sun, as it were, decomposes what had been so happily mixed together, and separates a striking whole into detached unimpressive parts."

It is always of service to the artist to examine the same

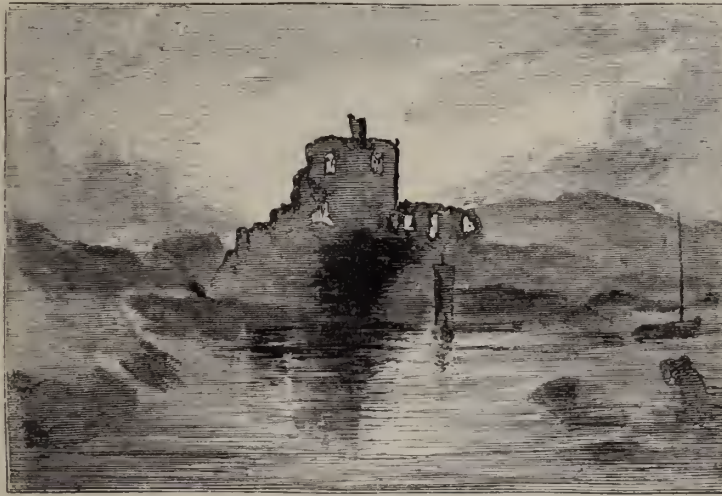


mould with wax to prevent this result; but the close spaces between finer lines are more difficult to deal with. Mr. Fruwirth having obtained his stereo intaglio, applies a thick coating of a suitable varnish or ink to the whole of the surface, besides building up the broad spaces with wax in the

scenes at different times of the day and under different effects. He then has an opportunity of speculating on the cause of the beautiful appearance at one time, and of the commonplace look most scenes have at other times.

Objects, which in themselves possess no interest, are frequently made to delight the eye, from their being productive of breadth. This cause seems to account for the pleasure we receive from many massive, heavy objects, which, without this charm, and considered singly, are positively ugly. Some pictures, though bad in every other respect, but possessed of breadth, attract and arrest the attention of the cultivated eye; while others, admirable in detail and colour, but where the harmonizing principle is wanting, will

often be passed over as uninteresting. But breadth must not be carried out to effeminacy; the most healthy system requires a tonic sometimes, and too much sweetness and breadth become sickly. Illustrations of pictorial art are often to be derived from music. It is so here. The first effect of mere breadth of light and shadow is to the eye that which mere harmony is to the ear, both produce a pleasing repose, which, if not relieved, becomes dull and wearisome. The eye requires to be awakened occasionally, for it must be remembered, however delightful repose is, repose leads to sleep and sleep to death. But as harmony and design must be preserved in the wildest music, so must breadth be observed in the most complicated scenes.



The illustration to this chapter, the original of which is a fine example of breadth of effect, is taken from Turner's "Liber Studiorum," and was used by Mr. Lake Price in his articles on a similar subject to the present one in the PHOTOGRAPHIC NEWS some years ago. Its excellence as an example of breadth must be my excuse for introducing it again. Mr. Lake Price observes in reference to it:—"The fine subject of 'Norham Castle' is a masterly example of this management, [breadth of effect]. Here the dark mass of the castle occupies the centre of the picture, and is the focus of shadow, diminishing thence to the edges of the subject; the principal light of the sky being brought into immediate contact with the strong dark, the qualities of increased brilliancy and great breadth are simultaneously attained. The beautiful and poetic effect of this subject should animate some of our landscape photographers to endeavour to emulate similar effects from nature. The student will gain considerable knowledge of the capabilities of chiaroscuro, in its application to landscape, by repeated and careful examination of the broad, varied, and masterly effects to be seen in Turner's 'Liber Studiorum,' which is in itself a compendium of light and shade applied to landscape composition."

Painters have found it difficult to unite breadth with detail, but it has been attained, in the works of some great masters, in great perfection, showing that breadth is not inimical to finish as insisted by some writers and painters, and by one photographer. The microscopically finished works of Gerard Dow are never wanting in breadth, and the well-known pictures of Meissonier, highly elaborated as they are, are remarkable for the very qualities which it has been supposed high finish would destroy. But the photographer is not so much troubled as the painter with this fear of detail destroying breadth. The utmost extreme of definition is quite compatible with the most tender atmospheric gradations. The detail of nature need never be sacrificed for the sake of representing atmosphere. If definition and atmosphere

exist together in the subject to be photographed they should appear in the picture, or something is wrong. Either the chemicals are out of order, the exposure is not well timed, the development or intensification ill-judged, or the photographer has attempted to do on one plate that to which he should have devoted two or three, and combination printing.

Nothing, perhaps, is more pleasing or more flattering to the vanity and indolence of artistic mankind than the being able to produce an agreeable general effect with little labour and less study; this they call "artistry," and think clever, but it is not the intention of painting which should represent nature, and not an abstract idea of it. Mere sketches of breadth no more represent nature than do the "tone" pictures of some modern artists, in which the changes are rung on all the gradations, from the very limited scale of lavender to white, represent colour. These pictures, in which the painters probably endeavour to "snatch a grace beyond the reach of art," are very clever as far as they go, but they, like sketches that show only breadth, do not go beyond A or B in the alphabet of art.

ON THE MEASUREMENT OF THE LUMINOUS INTENSITY OF LIGHT.

BY WILLIAM CROOKES, F.R.S., ETC.*

THE measure of the amount of free polarization present in the disc $c d$, will give the relative photometric intensities of D and C.

The letter I represents a diaphragm with a circular hole in the centre, just large enough to allow the compound disc $c d$ to be seen, but cutting off from view the side discs $c' d'$. In front of the aperture in I is placed a piece of selenite of appropriate thickness for it to give a strongly-contrasting red and green image under the influence of polarized light. K is a doubly refracting prism, similar in all respects to H, placed at such a

* Continued from p. 370.

distance from the aperture in I that the two discs into which I appears to be split up are separated from each other, as at *g r*. If the disc *c d* contains no polarized light, the images *g r* will be white, consisting of oppositely polarized rays of white light; but if there is a trace of polarized light in *c d*, the two discs *g r* will be coloured complementarily; the contrast between the green and red being stronger in proportion to the quantity of polarized light in *c d*.

The action of this arrangement will be readily evident. Let it be supposed, in the first place, that the two sources of light, D and C, are exactly equal. They will each be divided by I into two discs, *d' d* and *c' c*, and the two

polarized rays of which *c d* is compounded will also be absolutely equal in intensity and will neutralize each other and form common light, no trace of free polarization being present. In this case the two discs of light, *g r*, will be colourless. Let it now be supposed that one source of light (D, for instance) is stronger than the other (C). It follows that the two images *d' d* will be more luminous than the two images *c' c*, and that the vertically polarized ray *d* will be stronger than the horizontally polarized ray *c*. The compound disc *c d* will therefore shine with partially polarized light, the amount of free polarization being in exact ratio with the photometric intensity of D over C. In this case the image of the

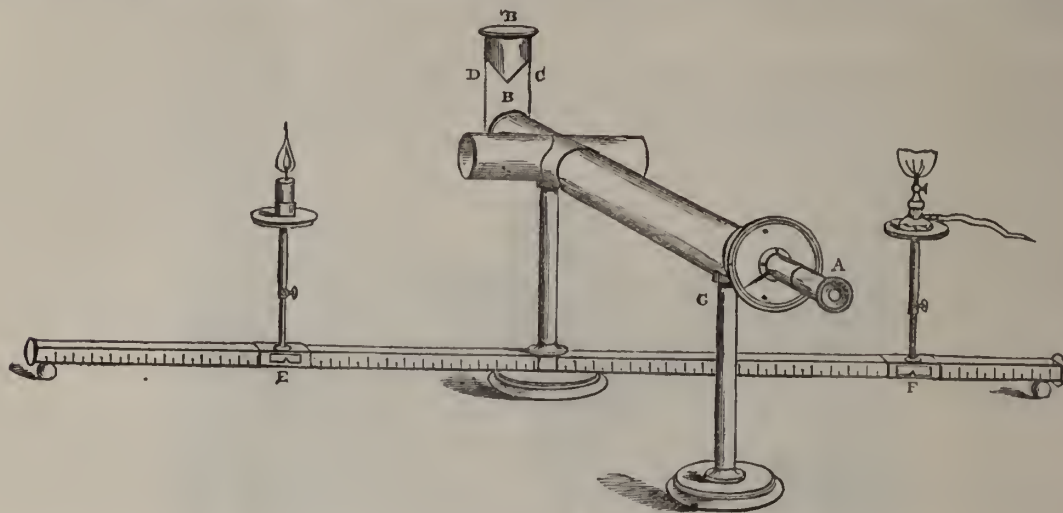


Fig. 2.

selenite plate in front of the aperture I will be divided by K into a red and a green disc.

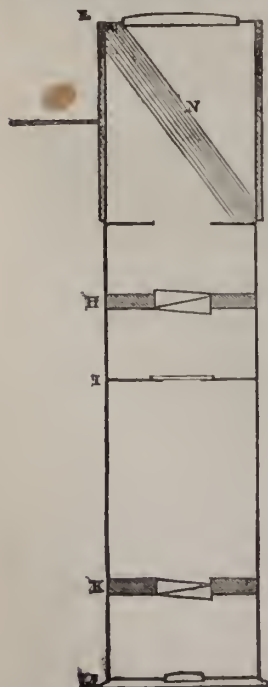


Fig. 3.

lect the rays from D B C (fig. 2), and throw the image into the proper part of the tube. At M is another lens, so adjusted as to give a sharp image of the two discs into which I is divided by the prism K. The part N is an adaptation

Fig. 2 shows the instrument fitted up. A is the eye-piece (shown in enlarged section at fig. 3). G B is a brass tube, blacked inside, having a piece, shown separate at D C, slipping into the end B. The sloping sides, D B, B C, are covered with a white reflecting surface (white paper or finely-ground porcelain), so that when D C is pushed into the end B, one white surface, D B, may be illuminated (as in fig. 2) by the candle, and the other surface, B C, by the lamp. If the eye-piece A is removed, the observer, looking down the tube G B, will see at the end a luminous white disc divided vertically into two parts, one half being illuminated by the candle E, and the other half by the lamp F. By moving the candle E, for instance, along the scale, the illumination of the half D B can be varied at will, the illumination of the other half remaining stationary.

The eye-piece A (shown enlarged at fig. 3) will be understood by reference to fig. 1, the same letters representing similar parts. At L is a lens to collect the rays from D B C (fig. 2), and throw the image into the proper part of the tube. At M is another lens, so adjusted as to give a sharp image of the two discs into which I is divided by the prism K. The part N is an adaptation

of Arago's polarimeter; it consists of a series of thin plates of glass, capable of moving round the axis of the tube, and furnished with a pointer and graduated arc (shown at A G, fig. 2). By means of this pile it is possible to partially polarize the rays coming from the illuminated discs in one or the other direction, and thus bring to the neutral state the partially polarized beam *c d* (fig. 1) so as to get the images *g r* free from colour. It is so adjusted that when at the zero point it produces an equal effect on both discs.

The action of the instrument is as follows:—The standard lamp being placed on one of the supporting pillars which slide along the graduated stem (fig. 2), it is adjusted to the proper height, and moved along the bar to a convenient distance, depending on the intensity of the light to be measured; the whole length being a little over four feet, each light can be placed at a distance of twenty-four inches from the disc. The flame is then sheltered from the currents of air by black screens placed round, and the light to be compared is fixed in a similar way on the other side of the instrument. The whole should be placed in a dark room, or surrounded with non-reflecting screens; and the eye must also be protected from direct rays from the two lights. On looking through the eye-piece two bright discs will be seen, probably of different colours. Supposing E represents the standard flame, and F the light to be compared with it, the latter must now be slid along the scale until the two discs of light, seen through the eye-piece, are about equal in tint. Equality of illumination is easily obtained; for, as the eye is observing two adjacent discs of light, which pass rapidly from red-green to green-red, through a neutral point of no colour, there is no difficulty in hitting this point with great precision. It has been found most convenient not to attempt to get absolute equality in this manner, but to move the flame to the nearest inch on one side or the other of equality. The final adjustment is now effected at the eye-end, by turning the polarimeter one way or the other up to 45°, until the images are seen without any trace of colour. This will be found more accurate than the plan of relying entirely on the alteration of the distance of the flame along the scale; and by a series of experimental adjustments the value of every angle through which the bundle of plates is rotated can be ascertained once for all, when the future calculations

will present no difficulty. Squaring the number of inches between the flames and the centre will give their approximate ratios; and the number of degrees the eye-piece rotates will give the number to be added or subtracted in order to obtain the necessary accuracy.

The delicacy of the instrument is very great. With two lamps, each about twenty-four inches from the centre, it is easy to distinguish a movement of one of them to the extent of 1-10th of an inch to or fro; and by using the polarimeter, an accuracy considerably exceeding that can be attained.

The employment of a photometer of this kind enables us to compare lights of different colours with one another, and leads to the solution of a problem which, from the nature of their construction, would be beyond the powers of the instruments in general use. So long as the observer, by the eye alone, has to compare the relative intensities of two surfaces respectively illuminated by the lights under trial, it is evident that unless they are of the same tint it is impossible to obtain that absolute equality of illumination in the instrument which is requisite for a comparison. By the unaided eye one cannot tell which is the brighter half of a paper disc illuminated on one side with a reddish and on the other by a yellowish light; but by using the above-described photometer the problem becomes practicable. For instance, on reference to fig. 1, suppose the disc D were illuminated with light of a reddish colour, and the disc C with greenish light, the polarized discs d d would be reddish, and the discs c c' greenish, the central disc c d being of the tint formed by the union of the two shades. The analysing prism K and the selenite disc I will detect free polarization in the disc c d , if it be coloured, as readily as if it were white; the only difference being that the two discs of light g r cannot be brought to a uniform white colour when the lights from D and C are equal in intensity, but will assume a tint similar to that of c d . When the contrasts of colour between D and C are very strong—when, for instance, one is a bright green and the other scarlet—there is some difficulty in estimating the exact point of neutrality; but this only diminishes the accuracy of the comparison, and does not render it impossible, as it would be according to other systems.

No attempt has been made in these experiments to ascertain the exact value of the standard spirit-flame in terms of the parliamentary sperm candle. Difficulty was experienced in getting two lots of candles yielding light of equal intensities, and when their flames were compared between themselves and with the spirit-flame, variations of as much as 10 per cent. were sometimes observed in the light they gave. Two standard spirit-flames, on the other hand, seldom showed a variation of 1 per cent., and had they been more carefully made, they would not have varied 0.1 per cent.

This plan of photometry is capable of far more accuracy than the present instrument will give. It can scarcely be expected that the first instrument of the kind, roughly made by an amateur workman, should possess equal sensitiveness with one in which all the parts have been skilfully made with special adaptation to the end in view.—*Quarterly Journal of Science.*

ON SOME NEW EXPERIMENTS ON LIGHT.

BY J. H. GLADSTONE, PH.D., F.R.S.

THE *Chemical News* reports a lecture at the Royal Institute, by Dr. Gladstone, from which we make some extracts.

The speaker commenced by referring to the fact that we are constantly making new experiments or observations on light: in fact, all seeing is but a comparison of different degrees of light and shade, and the contrast of colours. Most of the rays that meet our eyes from surrounding objects are reflected rays, but some of the commonest things, such as the water-bottles and tumblers of cut-glass on our dining tables, exhibit beautifully the bending, the magnifying, the diminishing, and the production of coloured fringes, due to refraction. The purpose of this discourse was to rise from the simplest phenomena of this kind to a consideration of refraction-equivalents, and to describe the state of our present knowledge in regard to them.

By means of the electric lamp it was shown that a piece of glass, or other transparent body, will throw a perfectly black shadow if the two surfaces through which the ray passes be not parallel; that the light is then bent on one side, and at the same time spread out into its component colours; that this bending (refraction) varies with the amount of inclination

of the two surfaces to one another, but in such a way that the sine of the angle of refraction bears a constant ratio to the sine of the angle of incidence; that this constant number, termed the index of refraction, or μ , belongs only to the one substance, each solid, liquid, or gas, having its own index; that there is no necessary connection between the amount of refraction and the length of the spectrum (dispersion) caused by different substances, whether gaseous, liquid, or solid—for instance, a solution of an iodide always disperses more than a solution of the chloride of the same metal, even though it be diluted to the same amount of refraction.

This index of refraction is affected by change of temperature. In liquids, and probably in all gases, the bending decreases as the thermometer rises; in solids, on the contrary, as lately shown by Fizeau, the change is in the opposite direction, crown glass always remaining the same, and fluor spar being the only case where he observed a diminution. This was experimentally demonstrated in regard to liquids. Thus a yellow sodium ray, which had passed through a hollow prism filled with oil of nutmeg, and thence through another filled with bisulphide of carbon, moved some inches along the screen when the nutmeg oil was warmed a few degrees by stirring it with heated iron wire. This index of refraction is still more materially affected when a body passes from the solid to the liquid, or from the liquid to the gaseous condition: a fact that was illustrated by the visibility of the water melted in crystalline spaces in the middle of a block of ice.

The index of refraction of a mixture is moreover not always the mean of the indices of its constituents. Thus a ray passed successively through two hollow prisms filled with equal quantities of alcohol and water respectively, fell on the screen in a certain position; but when the two liquids were mixed together, and divided between the two prisms, the ray was visibly refracted to a greater distance.

These changes depend on the alterations of volume which the substances undergo; and the speaker, in conjunction with the Rev. T. Pelham Dale, had observed in liquids that the index of refraction, minus unity, divided by the density (in symbolic

language $\frac{\mu-1}{d}$) is constant for all temperatures, and for all mix-

tures, or rather that the coincidence is very close, but not quite perfect, on account of some other law not yet understood. This conclusion has been abundantly verified by Landolt of Bonn, Ketteler, and Wüllner, and the former experimenter has founded upon it a method of analysing mixtures of liquids.

This unchangeable number was termed the "specific refractive energy" of the substance, and it seemed to hold good, notwithstanding a change from the solid to the liquid or the gaseous condition. It was early observed that the specific refractive energy of a compound bore a close resemblance to the mean of the specific refractive energies of its components. Landolt, by multiplying this number by the chemical equivalent, facilitated the calculation greatly. He termed this new

number the "refraction-equivalent," $P = \frac{\mu-1}{d}$, and proofs have

rapidly accumulated that the number is little affected, not only by temperature, change of aggregate condition, mixture, or solution, but even by strong chemical combination.

Thus diamond, which is crystallized carbon, has the refraction-equivalent 5.0; sulphur has 16.0. Bisulphide of carbon, CS_2 , which is nearly the most refractive liquid known, should therefore be represented by $5 + 2 \times 16$, that is, 37.0. The experimental number is 37.3. But the diamond will burn in oxygen, and is thus converted into carbonic anhydride, while it is possible to reduce this gas into another containing only half the amount of oxygen, namely, carbonic oxide. The refraction-equivalents of these gases, as deduced from Dulong's observations, are respectively 10.03 and 7.53; but the difference between CO_2 and CO is one equivalent of oxygen, and the difference between the above numbers is 2.5. This, then, may be taken as the refraction-equivalent of oxygen, and subtracting it from $CO=7.53$ we have remaining $C=5.03$, practically the same number as that obtained directly from crystallized carbon. Similarly, but generally by more indirect methods, it has been determined that this element, whether pure, as diamond, or combined with other elements, to form gases, as the above-mentioned, coal-gas, or cyanogen; or liquids, as chloride of carbon, benzole, oil of turpentine, alcohol, or ether; or solids, as paraffin, sugar, or camphor, is still exerting the

same influence on the rays of light that set its particles in motion, an influence that we can express by the number 5.0. Again, to revert to sulphur, the two salts, sulphocyanide and cyanide of potassium (K S Cy and K Cy) differ by one equivalent of this element, and their refraction-equivalents as determined from their aqueous solutions are respectively 33.4 and 17.1, numbers differing by 16.3, a number almost identical with that reckoned from molten sulphur. In this way the refraction-equivalents of a large number of the elements have been determined, and the following table comprises what seem the most probable numbers among those that have been hitherto published by Landolt, Haagen, and Schrauf, as well as the speaker:—

	Atomic-weight.	Refraction-equivalent.
Hydrogen ...	1.0	1.3
Chlorine ...	35.5	9.8
Bromine ...	80.0	15.7
Iodine ...	127.0	24.4
Oxygen ...	16.0	3.0
Sulphur ...	32.0	16.0
Carbon ...	12.0	5.0
Silicium ...	28.0	6.2
Nitrogen ...	14.0	4.1
Phosphorus ...	31.0	18.5
Arsenic ...	75.0	16.0
Antimony ...	122.0	25.7
Vanadium ...	51.4	25.4
Sodium ...	23.0	4.9
Tin ...	118.0	15.2
Copper ...	63.4	11.2
Mercury ...	200.0	21.6

The above numbers are reckoned for the red ray. Most of them as yet claim to be considered only as approximative; and it seems certain that some elements, as oxygen and sulphur, have more than one refraction-equivalent.

Vanadium, though included in the above table, has only just been determined, and that from the oxytrichloride which Professor Roscoe exhibited a few weeks before. It is interesting, as it supports his theory of the close analogy of phosphorus and vanadium, for these two bodies, with sulphur, exceed all others in refraction, and especially in dispersion.

The speaker stated that he was now engaged in examining the effect of salts in solution on the rays of light, and that he hoped to determine in this way the refraction-equivalents, not only of a multitude of salts, but of the metallic elements themselves.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

THE usual monthly meeting was held on the 8th ult., Mr. A. TAYLOR in the chair.

The minutes of a previous meeting having been adopted,

M. COCHET presented to the Society a number of fine proofs of the monuments of Nîmes, some of which were of large size, and stated that they were produced by the Triple and Rectilinear lens of Dallmeyer, upon the perfection of which instruments he spoke in high terms, and stated that from the contracted space it would have been impossible to obtain them without a lens of wide-angle yielding straight lines.

After some conversation on the Woodbury process,

Mr. TAYLOR (the Chairman) exhibited some specimens of Swan's Carbon Process, and also Mr. Wharton Simpson's work on Carbon Printing. The specimen excited much admiration.

M. VIDAL said if such beautiful and stable results could be obtained by this process, and they had before seen some of equal excellence, it was surprising that such comparative indifference to the process continued to exist in France, and hoped that they would soon imitate the example of their foreign confreres.

Mr. TAYLOR said he had recently visited England, where he saw many fine specimens of carbon printing, and understood that it was being tolerably generally adopted. He had had the pleasure of seeing and conversing with Mr. Wharton Simpson, who, in speaking of the various new processes, had mentioned, as a means of overcoming the difficulties of using ordinary gelatine in hot weather, the probable advantage of employing

a vegetable gelatine which did not readily become fluid, even at a high temperature. This gelatine was used for culinary purposes in Java, and retained its solid gelatinous form in very hot weather.

M. VIDAL, who had made trial of this vegetable gelatine, believed that in addition to the advantage named it would give still more delicate results than the ordinary gelatine, and hoped to communicate some further results at the next meeting of the Society.

The COMMITTEE charged with the examination of the *Sel Clement* stated the results of experiments. It was, they said, more economical than the ordinary nitrate of silver, as the inventor had affirmed, and that was an essential point of superiority. The proofs required, they thought, a little longer exposure, but they came out very well and very regularly. By using twenty per cent of *Sel Clement* some time was gained as regarded the exposure, and there was still a notable economy compared with the ordinary nitrate employed at fifteen per cent. As regarded the preservation of whiteness in the paper, there was also an advantage, as the paper prepared by the Committee continued white for five or six days without any especial means taken for the purpose, while those examples which were kept enclosed showed no alteration at present, after a lapse of more than fifteen days. The Committee, therefore, did not hesitate to advise the use of that salt as really advantageous, and they recognized the truth of the assertion made by M. Clement in support of his invention. Without occupying themselves with the matter on a chemical question, it was more important to ascertain whether it was practical, if there was economy in it, and, as to the paper, whether it preserved its whiteness. On these two points the Committee had concluded in the affirmative.

M. VIDAL placed upon the table some specimens of the *Carrier* paper, sensitized and unalterable. He was happy to state that M. Carrier had arranged for the manufacture of his sensitive paper. He hoped that until the carbon process became more general that paper would render great service to the art of photography. It was to be desired that local dépôts should be established, in order that when a few sheets were required they need not have to send to Paris for them. For the negative photometer, and for the photometer used in carbon printing, those sheets would prove valuable auxiliaries, because they preserved their whiteness for years. M. Vidal was pleased to testify that the specimens which he had in his possession for a long period remained without the least alteration, either in their colour or in the sensitiveness. When used for printing proofs, the paper gave fine blue blacks in a bath thus composed:—

Water ...	700 cub. centimetres
Chloride of gold ...	1 gramme
Water ...	500 cub. centimetres
Sulphocyanide of ammonia ...	100 grammes

Mix these two solutions in equal parts for whatever quantity may be required. If too much chloride of gold be used the image becomes too blue. It is necessary to print deep in the pressure frame.

The proceedings then terminated.

Correspondence.

PHOTOGRAPHIC NOTES ON THE CONTINENT.

[FROM A SPECIAL CORRESPONDENT.]

Vienna, 6th August, 1868.

Down the Danube, from Linz to Vienna, the country is very different to that about Passau. Instead of the forest scenery and densely-wooded slopes which shut in the river on both sides above Linz, the banks of the stream are studded with thriving villages, large well-built convents, and picturesque ruins. The panorama is certainly as fine, and, perhaps, more varied than that of the upper Danube, where the banks are not so much cultivated nor so populous inhabited. At one part, about midway between Linz and Vienna, called the Donau Wirbel, there is a very strong rapid, and here the view is particularly beautiful. On approaching Vienna the village and convents assume a more Eastern aspect, and the spires and steeples of the larger

buildings are ornamented with the peculiar Turkish or Russian domes and cupolas.

The Danube does not actually flow through the city of Vienna, or "Emperor town," as it is called in Germany, but passengers on entering the Austrian metropolis by water are conveyed thither by a canal leading from the river. The town is just now in holiday garb, for the *Schützen Fest* is being held here, and the streets are full of riflemen in their picturesque shooting coats faced with green. Flags are planted along the principal thoroughfares, military bands are continually parading the streets, and *fétes* of all kinds are going on. Fifteen thousand foreign riflemen are said to have assembled from the different European countries and America, and the *Schützen-halle*, or shooting hall, which I visited on Monday last to hear some of Strauss' far famed music, is probably one of the finest and largest temporary buildings that was ever erected.

Passing to matters photographic, I may mention that I have visited several of the studios in the town. M. Ludwig Angerer, the royal photographer, whose charming group pictures are well known in England, possesses three studios in the town, one of which, viz., that specially employed for taking carte and cabinet pictures, I had the pleasure of visiting. It is situated in the Johann Gasse, in the busiest part of the town, plenty of side and top light being available, and the greater portion of the glass room being furnished with blue glass. The dressing-rooms are very conveniently situated on the same floor as the studio—just behind the screens—so that the sitter has but a very short distance to come. Cabinet portraits seem most in demand, and M. Angerer disposes of them at the very reasonable rate of ten shillings the half dozen. I saw several portraits taken, mostly of riflemen, all managed in a very prompt and skilful manner. The printing, mounting and similar manipulations are not carried on in this studio, but are confined to another building devoted specially to that class of work. The lenses used by M. Angerer are mostly those of Dallmeyer and Voigtländer.

The studio of M.M. Rabening and Monkhoven I was likewise permitted to visit; and here, again, I found the favourite style of portraiture to be the cabinet, excepting, of course, the enlargements, which are a speciality of this firm. For the last description of photographs a laboratory has been fitted up, in which the manipulation of large sheets of paper is proceeded with. One of the tanks used for developing, toning and fixing measured $4\frac{1}{2}$ by $6\frac{1}{2}$ feet, and there were besides, several other baths of somewhat smaller dimensions. All the collodion employed, as likewise all the chemical preparations used by the firm, are compounded on the premises, and by this means an exceedingly regular system of working is insured. The glass room possesses but little side-light, but is provided with illumination mostly from the top. The portion of the room in which the camera is placed, and where the operator stands, is almost in utter darkness; in fact, so much so, that the plate may be sensitized or developed in the dark-room leading from this part of the studio without the door of the laboratory being closed. The dark room is always kept at an even temperature, a stream of cold water being allowed to flow into the room during hot weather, and artificial heat employed in the winter months. The horizontal bath is used for the sensitizing, and the vertical bath for the fixing of plates. It is the custom to intensify after fixing, and finally to fix again, whereby the negatives are said to gain in brilliancy and transparency. No other lenses but those of Dallmeyer are used.

I was shown Dr. Van Monckhoven's enlarging apparatus in working order, magnifying a carte-de-visite picture upon a screen three feet long. The pictures are produced direct, and not by development, except in very bad weather, hard pictures being produced upon nitroglucose paper, and soft ones upon salted paper. With a good light, an enlargement is produced in a quarter of an hour, without having recourse to any accelerating process, such as the use of ammonia vapour, &c. The original carte negative, from which

the enlargement is taken, is left unvarnished, and is never intensified.

The show of photographic portraiture in the streets is remarkably fine, and certainly equal to that of Paris. The specimens exhibited by Dr. Heid, M.M. Mahlknecht, Luckhardt, Lowy, Adele, and others too numerous to mention, are certainly very superior, and the prices asked in most cases are remarkably reasonable. Of the minor class of photographers there appear to be but few in Vienna.

Ischl, 8th August, 1868.

Beautiful Ischl, situated in the middle of the most sublime scenery of the Salzkammergut, is the spot from which I write these lines. As it is the most fashionable watering place of Austria, and the favourite resort of the Empress, I was in the hopes that, in common with our own Spas, the town would contain one or two photographers of note whom I might pick up a few stray hints. As I have not, however, yet seen anything worthy of mention, I shall defer any further remarks until I reach Salzburg.

Talk in the Studio.

NORTH LONDON PRESENTATION PRINT.—The North London Committee appointed to select the presentation print, have been enabled, through the liberal terms at which the most suitable prints were offered by the producers, to offer to the members the two best prints submitted for competition. One is a magnificent 12 by 10 figure subject, by Mr. Lake Price, entitled "The Falconer," and the other a 16 by 12 landscape, with wondrously fine clouds, by Mr. N. K. Cherrill. It is hoped that the prints will be ready for distribution at the first meeting of the Session in October next.

THE FORTHCOMING ECLIPSE.—As our readers know a total eclipse of the sun, of a very remarkable character, will take place on the 18th, not visible, however, in this country as the central line will pass just south of Arabia, across India and the northern part of Borneo to the northern limit of Australia. The central eclipse begins at half-past three in the morning of Tuesday. This eclipse possesses unusual features of interest. The greatest possible radius of the circular shadow of the moon thrown on the earth careful computation gives as 174 miles. An eclipse of this extent cannot happen once in many thousands of years, nor can one happen often which approaches even closely to the conditions required to make the duration of total darkness the greatest possible. In the great eclipse of the next week nearly all the conditions which tend to increase the moon's shadow are nearly fulfilled. At the place which is most favourably situated the total eclipse will last six minutes fifty seconds. The exact position of this spot is in longitude east from Greenwich 102 deg. 50 min. 6 sec., and north latitude 11 deg. 35 min. 7 sec. As our readers know several observing expeditions will visit the best points of observation. Two expeditions, well provided with instruments, have proceeded from this country to India for the purpose of observing this great eclipse. The first, organized by Major Tennent, has been sent out under the auspices of the Royal Astronomical Society. The second has been sent out by the Royal Society, under Lieutenant John Herschell, son of Sir John Herschell. Mr. Pogson, superintendent of the Madras Observatory, will head a third expedition. France has sent out M. Jansen at the head of a well-appointed expedition. Prussia has sent Dr. Vogel and others to Aden; and the Pope sends out the Jesuit priest and astronomer, Father Secchi.

M. BRAUN'S REPRODUCTIONS.—The excellent photographic reproductions of the art treasures of Continental galleries by M. Braun, are well-known, and it is stated that he contemplates a visit to England for the purpose of reproducing the rare works comparatively buried in this country. English photographers should look to it that the laurels be not shorn on their own ground. The *Journal of the Society of Arts* speaks in high terms of a highly-interesting portfolio of photographic reproductions in pigment printing of designs by the old masters, belonging to the various museums in Europe. The work includes nine hundred designs from the Louvre, eleven hundred pieces from the Albertine of Vienna, one hundred and fifty pages from the collection of the Grand Duke of Saxe Weimar, and several hundred drawings from the little-known Uffizi collection, at Florence. M. Braun, it states, has lately pro-

duced, at Milan, copies of the Ambrosienne entire, with the eighty drawings by Leonardo de Vinci, and the cartoon of Raphael's "School of Athens;" at Venice he has reproduced more than three hundred of the designs in the Academy of the Beaux Arts; at Florence he has photographed the most remarkable examples of sculpture, ancient and modern.

TRANSPARENT METAL.—From one of our German exchanges we copy a statement that a transparent metal has been discovered, the component parts of which are water-glass and copper: "It is of a deep orange hue, can be melted and cast, wrought under the hammer, and rolled. Files will not scratch it; it is translucent, and capable of being wrought into ornaments of rare beauty." Evidently a chemical canard, unworthy of serious notice.—*Scientific American*.

OPAQUE GLUE.—Dr. Vander Weyde, writing to the *Scientific American* says:—"I see a recipe of a correspondent for making opaque glue, which is as injurious to the glue as the bone dust proposed for that purpose in a former number. Bone dust being gritty and not mixing with the glue spoils it entirely. I find by analyzing a specimen of very white opaque glue of excellent quality, that the white substance is nothing but carbonate of lime very finely divided, probably introduced in the form of the so-called Paris white. I find in trying the mixture of this substance with glue, that it has two effects beneficial to the manufacturer: first, in giving a dark coloured glue a lighter shade and thus presenting an appearance of a higher priced article, and, second, in adding to the weight of the glue by the addition of a substance only about one tenth of its value. The beauty of this adulteration is that the sticking qualities—which are of course the only ones the consumer cares for—are not in the least deteriorated, but, on the contrary, seem improved."

To Correspondents.

HENRY BERLON.—Herr Grasshoff's address is 51, Behren Strasse, Berlin. We should think Mr. Trubner would order the work for you. Herr Grasshoff is an artist, and himself retouches negatives. Herr Lindner produced and retouched the negative a print from which was issued in a recent number of Dr. Vogel's *Mittheilungen*.

REV. J. H. JOHNSON.—We will submit the queries to Mr. Bovey. For our own part, we prefer the use of a little carbonate of lime when the gold salt shows any trace of acidity. As a rule, however, when the double chloride of gold and sodium is used there need be no excess of acid at all.

HENRY WILLIAMS.—We believe that collodio-chloride of silver is supplied by most dealers. Messrs. Mawson and Swan, Huggon and Co., and some others prepare it. You will find instructions for making and using it in our YEAR-BOOK. 2. We do not know of any agent for Obernetter's paper in this country.

MORPHINE.—There is a special form of printing-frame made for printing transparencies on dry plates from uncut negatives, permitting the necessary movement of the plate. A very good one was devised by Mr. Smith, of Negretti and Zambra's, and may doubtless be obtained of that firm. If you print on wet collodion in the camera no cutting is necessary, as the requisite transposition of the images is necessarily made in the camera, by each half being practically turned round on its own axis. 2. We are not in possession of the information in reference to Cook's apparatus which you require.

W. J. A. G.—It is illegal to make copies, for your own amusement, of copyright pictures. The fact that a sale is generally proved in order to secure conviction arises from two circumstances: first, it is generally the easiest mode of proving delinquency; and, second, because the actual producers are rarely caught; the dealers only, as a rule, come within reach of detection. Very few proprietors of copyright would, we apprehend, take the trouble to prosecute an amateur whose copies were *bona fide* for his own amusement only. But the terms of the Act are stringent. It enacts that if any person not being the owner of a copyright shall, without consent of the owner, "repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution," he shall forfeit a sum not exceeding ten pounds for each offence. 2. A mixture of glycerine and water may be used instead of golden syrup and water.

HENRY WILCOX.—All the manipulations in Mr. Gordon's gum process, as described in our YEAR-BOOK, remain precisely the same, except the use of the iron developer instead of that at first prescribed. 2. Drain upright on clean blotting-paper. 3. A changing box for 12 by 10 plates would be costly, and perhaps a little difficult to manage. Double backs would be best; or a changing bag might be managed possibly. 4. The rapid rectilinear lens is not intended for studio work, but would probably be as rapid as the single wide angle for landscape work. 5. For enlarging, your No. 1 will answer well, and will be most convenient. 6. No. 1 in answering our correspondents, we have undertaken a duty which a very lengthened experimental and practical acquaintance with

almost every branch of photography has rendered easy and pleasant to us, and we do not, therefore, get tired of what you term the "eternal interrogatories" put to us.

J. BARRATT.—Registration will protect a design or shape, but it will not protect a principle, nor will it protect anything dependent on the working together of parts. A patent is required for such protection. Whether registration will serve your purpose or not we have not data before us to determine. The protection of registration can only extend for three years. It is of course much cheaper than a patent, only costing three or four pounds.

SPECULA.—Your concentrated nitrate of silver solution having been in the sun during the hot months which have elapsed since Mr. McLachlan's communication ought now to be ready. The next step is to proceed exactly in accordance with his instructions as to iodizing, dilution, and rest for a few days, until any excess of iodide of silver is re-precipitated. The only modification in which you can do justice to the author of any process is to follow implicitly his own directions.

D. W. S.—Unless you have some skill in colouring you will scarcely succeed in colouring glass transparencies for the magic lantern; and if you have any skill you will succeed best with the medium to which you are most accustomed, whether oil or water. If you wish to use aniline colours you will find it best first to give the transparencies a varnish of dilute albumen, about 1 part white of egg and 4 parts water. This varnish will also aid you in using ordinary water colours.

ENGINEER.—The article in our YEAR-BOOK practically contains all the information which has been published on Mr. England's dry process. On p. 187 of our last Volume you will find his communication to the Photographic Society on the subject; and in the early part of the same Volume many communications and comments from other contributors, but we do not remember that any of these contain more details than Mr. England himself has communicated. The trustworthiness of the process is best avouched by the fact that Mr. England brought home from his last summer's tour 300 perfect negatives.

T. F.—We have once met with a similar case to that in the spotted example you enclose. It arose on that occasion from prints being left a long time in water without movement or agitation. The prints which had floated to the top of the water looked spotted with dust, and on sponging the surface it was found to be covered with spots in which the albumen was removed, as in the example forwarded. It was clear that the long soaking with, possibly, the action of lime salts in the water, possibly some atmospheric deposit from the operating room, had induced a decomposition of the albumen surface, dissolving it at the points of contact; but the precise cause we are unable to indicate. The yellow stain on the print is due to imperfect fixation, probably from the print sticking to another print or to the side of the dish in fixing.

PHOTO-LITHO.—Your specimens are very good for a young hand; but they possess the defects most common to photo-lithography; that is, a certain rottenness in the fine lines and a want of rich depth in the blacks. What is the nature of the process you employ? We shall be glad to hear of your progress and see more of your work.

R. T. S.—You will find the description in question on p. 38 of our Fourth Volume. The principle involved preserves the water and the print constantly in motion, and keeps a fresh supply of water constantly running in, whilst the old water is emptied by a siphon.

DR. P. LIESEGANG.—Many thanks. We will write soon. We have not received the last number of the *Archiv* containing the formula you mention. The last which has reached us is No. 137. Will you kindly forward us the number in question.

T. JONES.—We are not aware of any agent for the Obernetter paper in England.

ELECTRO.—The journal styled the "Electrician" has, we understand, been discontinued for some years.

Q.—The statement is not true. The resolution was passed without a single dissentient. Neither of the gentlemen named either moved or seconded the resolution. 2. Yes: your conjecture is probably correct; imaginary existences; but we cannot go into the matter here.

IGNORAMUS.—The back of the plates is to be painted after the preparation is complete, and before exposing of course. It is because the sensitive film is very transparent, and therefore the plates are liable to the defect which has been erroneously styled "blurring." 2. The paint is of course washed off after exposure. If the alkaline developer is used, the image is brought out by the combined action of pyro and ammonia; but if you consult Mr. Gordon's recent article you will find that he recommends iron development. Your letter was not in time for an answer in our last.

DR. PHIPSON.—Received: "Sur l'application de certaines propriétés optiques des corps à analyse Chimique des substances minérales et des substances organiques, par M. le Docteur Phipson." Many thanks.

G.—An angle of 45° answers well; but a little modification is not of importance. It is important to secure a good pitch to throw the water off in wet weather, and prevent a tendency to leakage.

ANXIOUS.—You do not state on what point you require an opinion. The negative appears to have been taken in a dull light, and is thin and lacking in vigour, partly from bad light and partly, probably, from the quality of the collodion.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 520.—August 21, 1868.

CONTENTS.

	PAGE		PAGE
Mons. Adam Salomon in London	397	Likeness in Portraiture: Liability of Sitters.....	403
The American Bromide Patent	398	A Chapter in the Early History of Photography	404
Critical Notices	399	Correspondence—Photographic Notes on the Continent—White	
Photographic Printing in Silver, Theoretical and Practical.		Pigment in Carbon Printing	405
By W. T. Bovey	399	Talk in the Studio.....	406
Sketches of Travel from a Sun-Fainter's Portfolio. By Stephen		To Correspondents	407
Thompson.....	401	Photographs Registered	408
Pictorial Effect in Photography. By H. P. Robinson.....	402		

MONS. ADAM-SALOMON IN LONDON.

MONS. ADAM-SALOMON has just returned to Paris, after a week or two spent in London, and we have had the pleasure of spending a good deal of time in his company, listening to his remarks on the art and practice of photography. We have also had the good fortune to receive further examples of his charming portraiture, some of which exceed, if possible, any of the wondrous pictures which we have before noticed, and which some of our readers have had opportunity of examining.

Here we have a portrait of a noble little fellow, in a half-sitting, half-reclining position, the treatment of which was suggested, M. Salomon informs us, by a picture by Sir Thomas Lawrence—probably the portrait of Master Lambert. Every part of the picture seems literally perfection. Whilst the general effect is one of extreme vigour, richness, and relief, on examining the details every part is found full of the most exquisitely delicate half-tone and modelling. A fair child, with profusion of light hair, a light dress, large white collar, white cuffs, and white stockings, there is nevertheless not a point so large as a pin's head of pure white in the picture, fine half-tone marking the gradations of every white object, the texture and colour of each being rendered by tones very distinct from those of the fair flesh, every portion of which is most perfectly modelled. The grace, ease, simplicity, and naturalness with which the child rests his fine head on a pretty hand, and the sweet unconsciousness of his expression, cannot be well described, but they are such as satisfactorily illustrate the fitness of photography, under favourable circumstances and in capable hands, for producing the highest art results in this direction. The composition and chiaroscuro of the picture seem simply faultless.

Another picture, of a totally different subject, is also a fine example of a similar kind of treatment, securing perfect gradation of tone, detail, texture, and modelling in light materials, without a single patch of white. This is a portrait of a lady, a brunette, with dark eyes and hair, in a white dress of tulle trimmed with white satin. Every undulation of every fold; every thread, in fact, in the light, soft, flowing drapery is perfectly rendered; every play of light and reflected light in the satin trimmings perfectly registered; but everything is full of tone: except a glancing light here and there, no patch of white is present much larger than the sparkling point of brightness on the pearls on the lady's bracelet. All this is secured without any sacrifice of perfect detail and richness in the dark hair and the dark accessories in the picture, the whole being singularly harmonious. We have not often seen a photograph which so thoroughly illustrated the possibility of a degree of perfect lighting rarely attained. On examining every part of this picture, it would seem as if the light had been especially arranged to secure relief in that part. The delicate

white arm which rests against the white dress is a perfect study of modelling and roundness, so nearly like the dress in colour, yet so different in texture, and so boldly in relief, it would seem, on examining it, as if the light had been arranged for that effect alone; yet further examination proves every other part of the picture as perfectly lighted and effectively rendered in its kind.

It is not a little singular that whilst great brilliancy is the first quality which strikes an observer in M. Salomon's pictures, yet the study of tone and harmony is that which mostly engages his attention. In speaking of tone here we do not mean tint or colour, but of fullness of gradation throughout the picture. No degree of vigour or of mis-called brilliancy obtained by great contrasts of black and white could compensate, in his estimation, for the absence of harmony. We were strongly reminded, in a conversation with him, of some remarks of Mr. Rejlander's on the same subject. If, by any chance, he remarked, it was necessary to print from a hard negative, he would prefer to expose the paper to the light for a minute or two, in order to degrade the tint, and so reduce the scale of tones, rather than have a picture with crude contrasts of black and white not united by proper gradations of half-tone.

Whilst maintaining and so admirably proving the capabilities of photography for art expression, M. Salomon, in common with most men possessed of the faculty of creative art, feels deeply the tyrannical conditions and unplastic character which belong to photography. The photographer, he remarked, in endeavouring to produce a picture, is a slave to his light, his lens, his chemicals, his sitter; the perverseness or imperfection of any of these may defeat all his efforts to realize an idea and produce a work of art; and often, when exhausted and disappointed, he has retired for relief, rest, and tranquillity, to his sculptural atelier, where the modelling clay answered to every touch; no rigidly awkward muscles or perverse expression, no movement, no limited range of focus, no chemicals yielding only results out of all harmony with the aim of the artist, or giving negatives full of spots, streaks, or pinholes. Nevertheless, photography, with all its difficulties, is the subject of his intense enthusiasm, and its conditions, chemical and mechanical, are carefully studied, with a view to coax from it its most willing service to art purposes. He prepares his own collodion, and, in answer to a question as to the proportion of bromides and iodides he employs, we learn that he thinks it worth while to use constant variety to suit varying conditions of subject and of light. So also with his developer and with other controllable preparations. His most usual formula for developing is, however, as follows:—

Ammonia sulphate of iron	...	75 grains
Glacial acetic acid	...	75 minims
Sulphate of copper	...	7 grains
Water	...	3 ounces.

He is deeply interested in conversation with a company of photographers who surround him, and is readily communicative on all subjects connected with his experience in the art.

In printing, it is his practice to produce one impression from a negative himself, as a guide or pattern for his printer. If the negative require it, some portions are masked during printing with cotton wool, or sometimes with ground glass; small portions at the back of the negative are stopped out with transparent water colours, to retard in given degree the passage of light. Spots and pinholes are touched out, and occasionally, also, strongly-marked freckles; but beyond that there is no retouching on the negative.

Apropos of this question of retouching, an amusing incident occurred during his visit. A photographer of considerable position having heard that M. Salomon was in London, called upon him to pay a visit of courtesy and express appreciation of his pictures. In course of conversation he remarked that, of course, the pictures were retouched, and that much of their beauty was dependent on this fact, adding, "Of course I know it is said that this is not so, but strictly in confidence, and *entre nous*, touching is the great secret, is it not?" In reply to this, M. Salomon called for a sponge, and asked his visitor to take the print in immediate question—the Duke of Hamilton, we believe—to wash the print thoroughly, and remove the touching. This having been done without altering the character of the picture, the visitor expressed his conviction that the touching was upon the negatives. This M. Salomon assured him was not the case; with the exception of the stopping out little defects, his negatives were untouched. Where a print required it, such touching as might be desirable was, of course, applied, but that in no case were they worked up so as to change the character of the picture. Satisfied from his experiment that it was not to retouching the excellence of the print was due, the visitor hit on a very brilliant idea: he had discovered, he thought, the secret of success. Each print was the product of two negatives identical in contour, &c., but varying in intensity; one being taken for the delicate lights, and the other for the deep shadows. A print was then carefully produced by printing from the two negatives in succession! The idea is undoubtedly ingenious; but M. Salomon had not tried it; he thought it would be difficult, if not impossible, to succeed satisfactorily, and assured his visitor that his results were produced by ordinary appliances without intricate or secret dodges.

M. Salomon had the pleasure of meeting in London, by his especial desire, Mr. Williams, Mr. Robinson, Mr. Rejlander, Mr. Blanchard, Mr. Mayland, and some others whose work he knew and admired. To Mr. Williams he sat for a portrait, being the first photograph for which he had ever sat. Messrs. Lock and Whitfield also obtained a negative of him, a print from which we have not yet seen.

More than one photographer in London courteously offered to M. Salomon the use of studios during his visit, should he desire to produce photographs; but, with the exception of a day spent at Tinnbridge Wells experimenting in conjunction with Mr. Robinson, M. Salomon did not attempt photography in this country. Mr. Robinson obtained several fine large negatives of his visitor.

To the method of finishing the print with an eucastic paste M. Salomon attaches considerable importance. For that employed on his pictures he has promised to send us the precise formula, which we shall have pleasure in giving to our readers, as it varies in some respects from the recipes hitherto published. Some other communications from M. Salomon, to whose kindly and genial communications we are much indebted, we hope also to place before our readers shortly.

We shall be happy to show the new specimens to any of our readers who may call at our residence, and we have obtained M. Salomon's promise to send some further examples to the exhibition meeting of the Society in November next.

THE AMERICAN BROMIDE PATENT.

A fortnight ago we announced that the application for a renewal of the bromide patent in the United States had been refused, and congratulated our American brethren on their final emancipation from a tax so irritating and iniquitous. A thirty-two page supplement to the *Philadelphia Photographer* puts us in possession of all the details of the case, both for the patentee and for the opposition, the latter having been chiefly managed by our friend Mr. E. L. Wilson, editor of the *Photographer*. As the matter possesses historic interest, a brief summary of the case will probably interest our readers.

The notorious bromide patent was obtained in America by Mr. James A. Cutting, of Boston, in 1854, and is dated July 11 of that year. The special claims in the specification are for two things: first, the displacing by alcohol of the water remaining in pyroxyline after it is washed, the collodion being, it is stated, more sensitive when the cotton is quickly dried; and, second, the use of bromide of potassium in collodion; the proportion given being $2\frac{1}{2}$ grains of the bromide and $2\frac{1}{2}$ grains of iodide of potassium, dissolved in a little water, to one ounce of collodion. It is worth noting that at the same time Mr. Cutting obtained two other patents for so-called improvements in photography: one for the addition of camphor to collodion, an addition, in our experience, rather injurious than otherwise; and another for cementing a glass over photographs by means of Canada balsam, an operation for which Mr. Ross had received the medal of the Society of Arts in this country years before. And it is further worthy of note that Mr. Cutting obtained a patent in England, on the 26th of the same month, in which was included the means of removing moisture from soluble cotton by means of alcohol, the use of camphor in collodion, and the cementing of glass over photographs by means of Canada balsam; but, oddly enough, in this patent there is no mention whatever of bromide, a circumstance which is very suggestive of some knowledge that at that time the value of bromides in collodion was too generally known in England to permit of the slightest chance of obtaining a patent for their use. Certain it is that in this country the use of bromides in collodion by some photographers was coeval with the discovery of the collodion process. The action of bromine in the Daguerreotype process and the effect of bromides in paper processes had been so well known for many years that it would scarcely have been possible to overlook their probable value in collodion. In the first treatises on the collodion process bromide is mentioned and recommended, and in the third number of the first photographic journal published in this country we find the use of bromides in collodion referred to, not as a novelty, but as a matter-of-course fact. At a meeting on the 5th of April, 1853, negatives were exhibited, in the production of which bromide of ammonium was employed, and the details were published; nevertheless, in America, in July, 1854, Mr. Cutting obtained a patent for the use of bromide of potassium, which has since been construed to mean any bromide.

This patent has been in operation during the last fourteen years, and enormous sums have been paid by American photographers for its use. One photographer alone, it appears, paid Cutting 10,000 dollars, and we find mention of the payment of various other sums amounting to upwards of 15,000 dollars. Cutting eventually parted with the bulk of his interest in the patent, finding great difficulty in enforcing it and in obtaining licence fees. The ultimate possessor, a Mr. Hubbard, has enforced it with much perseverance and shrewdness. The question of the validity of the patent has on several occasions come before the courts, but the cases have generally been compromised. The application for a renewal of the patent has been made by the executor of Mr. Cutting, who died in comparative poverty, it is stated, some time ago. He appears to have been a versatile genius, having latterly carried out to a large extent the "aquarial-garden business." He built and owned a boat

called the "Ambrotype," in which he used to make aquatic excursions to supply his garden with pickerel, horn-pouts, and whales; at one time he "ran" a Western saw-mill. He had various other patents: one for a beehive, one for a spark arrester, and one for a photo-lithographic process. The ground of the application for an extension was that Cutting had not derived sufficient remuneration for his invention.

The evidence by which the originality of the invention was sustained appears to have been weak and insufficient in the last degree, and it seems clear that if the case had ever been fairly brought to trial before that, the patent must necessarily have been proved invalid. The evidence of the opponents was very strong. One witness stated that he saw Cutting experimenting in 1853, and saw him refer to a book in which a bromide formula was published. Dr. Langdell, who was a partner with Cutting in 1853, gave evidence that at that date Cutting had not tried a bromide in collodion, and that he (Langdell) made the first trial, and communicated the result to Cutting. Dr. Cresson, of Philadelphia, a gentleman of high reputation as a chemist and expert, gave evidence of the use of bromides in 1852, pictures produced by their aid having been shown at the Franklin Institute at that date. A curious piece of evidence was introduced by this gentleman: he produced a bottle with its original label as follows:—

No. 10. Mo. 4—18, 1852.

Collodion	...	...	...	oz. j.
Iod. potassæ	...	...	...	gr. viij.
Brom. potass.	...	...	...	gr. IV.
Chlorid. sod.	...	...	...	gr. IV.
Water	...	...	...	m. 30
Absolute alcohol	...	...	...	m. 30

There is one piece of evidence for the opposition which is a little puzzling. Mr. F. Langenheim, an old photographer in Philadelphia, stated that in 1849 he used collodion, and employed salts of bromine in preparing it. As the recognized discovery of the collodion process by Archer was not published until 1851, this allegation by Mr. Langenheim requires some explanation or corroboration.

One of the most interesting documents connected with the case is the Report of Chief Examiner in the Fine Arts Department of the Patent Office, Mr. T. R. Peale. The original application for a patent was passed by this gentleman; but now, in the presence of fuller evidence, he distinctly states that Mr. Cutting was not the originator of the use of bromide in collodion, nor was he entitled to a patent for its use; and, further, that an extension of such a patent could not be granted without great injustice to the public.

After hearing the evidence, the character of which we have briefly indicated, it is not surprising that the Acting Commissioner of Patents refused the application for an extension, and American photographers will no longer be harassed by constant but irregular demands for payments of "room rights," demands which, being enforced by threats of legal proceedings, have often been paid simply to avoid the harass, risk, and loss of time inevitable in such suits. Without organization it is almost impossible to resist an imposition of this kind, and we congratulate our American friends on having secured a combination to defeat the attempt to extend an irritating impost, and on the able leadership under which this organization has been so successfully carried out.

Critical Notices.

HISTORICAL AND ARCHITECTURAL NOTES on the Parish Churches in and around Peterborough. By the Rev. W. D. SWEETING, M.A. Illustrated with Photographs by WILLIAM BALL. (London: Whittaker and Co.; Peterborough: E. T. Hamblin.)

THE value of photography is rarely better illustrated than when it is employed in delineating architectural and archaeological subjects, for which its literal and minute truthfulness

so especially fit it. Mr. Ball's photographs in the volume before us give the work, we have no hesitation in saying—and without any underrating of the laborious care with which the text has been written—its especial value and interest in the estimation of readers, the actual pictured representation of each church before the eyes investing written description and parochial records alike with a degree of interest which must otherwise have been wanting.

There are few districts in England more rich in parish churches of historic interest than the Eastern Counties, and the Master of King's College School at Peterborough has done good service in furnishing a valuable contribution to archaeology and to local history in writing these notes, and in collecting and arranging the records before us. The volume is a handsome one, well printed and well got up.

THE AMATEUR'S MANUAL OF PHOTOGRAPHY.

Edited by RICHARD KINGHAM. Fifth Edition. (London: Thomas Kingham.)

WE have before noticed this excellent manual in favourable terms. The fifth edition, now before us, is, we are informed, a reprint of the previous edition, no change or improvement of sufficient importance for notice having been made in photography since the issue of the fourth edition, fifteen months ago. The manual is a useful one throughout, and its value is much increased by the possession of several chapters on various subjects by Mr. Valentine Blanchard. The editor scarcely does his work full justice, by the way, in neglecting to append Mr. Blanchard's name to his articles where they appear in the text; with this exception we have nothing to say but commendation.

PHOTOGRAPHIC PORTRAITS, By WILLIAM NOTMAN, of Montreal, Canada.

WE have been favoured by Mr. Notman with some further examples of large portraiture, treated in the manner known as characteristic of the portraits by M. Adam-Salomon. In most respects these pictures are very admirable; they are brilliant, forcible, and well modelled; rich, deep, and warm in tone; and fine in composition. The chief fault we have to find is the presence in some of a few chalky and spotty lights. M. Salomon, we may observe, saw them, and expressed considerable approval.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

By W. T. ROVEY.

ACTINISM: ITS VARYING CONDITION AND INFLUENCE ON TONING ACTION, ETC.

IN the experiences of photographers who have submitted to practical tests the formula presented with my last communication, discrepancies have, I am not in any way surprised to learn, occurred in the results arrived at; and I was quite prepared, when I invited communications on the subject, to find sceptics denouncing "new-fangled innovations," and pointing out the virtues possessed by the "bleaching solutions" whenever they chance to work aright, which being, as they prove, matters of uncertainty, afford evidence that their constitution is allied to empiricism; their principles are open to a fuller investigation. My readers will probably admit that the apparent novelty of my views on toning matters places me in a position of some considerable difficulty, as I am arrayed, single-handed, against matured ideas, deep-rooted prejudices, and, added to these, the published opinions of many very able experimentalists, who are justly regarded as authorities in all matters pertaining to photographic science. I have accepted the conditions freely, not in a spirit of bravado, but with a full consciousness of the purity of my motives, which aim to accomplish some amount

of good by ridding an art of the elements of uncertainty in at least one direction. Having anticipated some objections, I am prepared to encounter others, and am desirous that the theories I have already advanced, together with others I am about to offer, may be fully and exhaustively discussed, for I hold that he who aims at truth should cling to no pet dogmas that are found to be based on error; his mind should be ever open to conviction, and, if assailed by error, he may find comfort in the thought that an infant truth is at all times surrounded by a net-work of misconception—that a wise and natural law has so designed it.

If we trace the history of civilization as far back as the pen of the historian has spanned, we perceive the course pursued by progress impeded with ifs, buts, sophistry, and scepticism, and these retarding influences, seen as things to be wept over, until the mind embraces a wider field of vision, when it is directly perceived that the improved results justify every retarding cause, and make visible the link which connects each impediment with the grand scheme of progression, a scheme that finds in each adverse influence a wisely ordered power, devised to separate the chaff from the wheat, by upholding error until truth has undergone a searching scrutiny to remove every cause of doubt that would dim the luster of final victory. If the human mind was more credulous, less conservative, less prone to cavilling, less inclined to doubting and disputations, progress would admit of a wide definition and muddle; anomalies, wisdom, and folly would each in their turn afford the interpretation. But I am turning into the "sidings" of digression, so will embrace a starting point that will lead to new arguments and observations in connection with the subject of gold toning.

From the numerous communications I have received, having reference to the method of toning I recently explained, I presume the subject has been more or less studied; and where success has been attained, some amount of curiosity has been felt to ascertain why so small an amount of gold should work so effectively with comparatively so large a bulk of water; and, seeking the results so nearly resembling the products of an acetate bath when in its best "form," some have been prompted to speculate on the reason why of the coincidence. The tale is briefly told. My chloride of gold and sodium bath embraces the actual motive principles possessed by the acetate, carbonate, and every other form of soda baths where sulphur forms no part of the compound. That such is a fact is clearly shown by the arguments advanced in my last communication; and the real advantage possessed by the toning method I advocate is simply an entire absence of every retarding influence which exists in all other kinds of toning solutions, by reason of the excess of acetate, carbonate, or other compound of soda provided in their construction; an excess which not only occasions an immense waste of gold, but adds a greater evil in the elements of uncertainty it provides. But we need not dwell further on this point, as we have to enter at length on subjects of greater importance, and the first to be considered is described in the heading to this paper; viz., "Actinism: its varying conditions and influence on toning action."

Photographers who are engaged regularly, or at intervals, in printing operations must have observed the perplexing differences that occur in the quality of the prints they produce; sometimes rich and full of vigour, at other times poor, flat, and unpromising; sometimes printing a fine violet tint, at other times a briske red. Not unfrequently the prints seem to fly up "overdone" with surprising rapidity; more frequent still the printing proceeds tardily, and the resultant prints prove unsatisfactory, notwithstanding the light is brilliant and the weather promising. These changes are, as a rule, attributed to the paper, which is supposed to have been mixed by the dealer, and he is consequently condemned, whilst the true cause remains unsuspected. I have paid much attention to this subject during the present year, and my intimate knowledge of the paper I

use has assisted me in arriving at, I believe, a correct conclusion, viz., that the variety of results described are due to meteorological influences. More than this, I believe—and the belief is founded on careful and continuous observation—that the actinic condition of the atmosphere exercises no small amount of influence on the human body, especially when the nervous organization belongs to the sensitive order. When the chemical force is applied in fits and starts, like magnetic storms, the printing proceeds with irregular rapidity, and the prints are violet-colour, full of vigour, and behave in a peculiar manner in the toning bath, as I shall by-and-by describe. Under the conditions alluded to, a nervously organized individual experiences a strange irritation, and his or her temper is for the time being none of the sweetest. On the other hand, when the prints move slowly, and a bright light is present, our nervous friend experiences a lassitude, and is inclined to dejection; but when the printing moves comfortably fast, no matter what light, and the prints assume the depth and hue which portray a successful day's work, our friend is in good spirits and feels remarkably well. These observations on a person unconnected with photography convince me that actinism is electricity under another name. It is, doubtless, hidden from the most sensitive of electrometers, but may exist, nevertheless, in a latent form; just as latent heat causes no change on the thermometer, was concealed from philosophers until the splendid researches and discoveries of Dr Black were made known.* The opinion I have formed is further strengthened by the behaviour of the toning bath when the batches of prints taken under the several conditions described are submitted to the action of my toning bath. The prints secured during the season of intermittent yet violent actinism tone with rapidity, and, except activity and care are observed, a case of over-toning ensues.

Mem.—To add a minimum quantity of gold when strengthening the bath. The condition of printing having at the proper time been observed, when the prints have been procured in the dragging manner before alluded to, toning action is slow. Mem.—To add a full amount of gold (3 to 4 grains, not over-dosed with hot water) to the solution. When the prints are in first-rate condition, and the bath not too strong with accumulated gold, the least given quantity of gold to be added to the bath, a full dose of boiling water to be applied. The remarks on prints of slow production apply to pictures printed in the direct sun; also to those printed when the atmosphere is excessively dry and hot, such as we have amply experienced during the present summer; for, be it remembered, the hygrometric condition of the atmosphere exercises a vast modifying influence on the character of the prints, over dryth being more injurious than over dampness, a proof of which is shown if we remove a piece of paper from a calcium drying-box and at once place it in the frame. I have found great advantage, when the paper was too dry, by placing it in an ordinary fuming-box, such as I described about three years ago, and placing damp sheets of blotting-paper at the bottom of the box in lieu of ammonia.

From the above remarks it will be perceived that to secure undeviating good results in printing operations the eyes of the printer must be kept wide open, and the conditions under which his day's work is executed should be keenly observed; and if he is of a philosophical temperament and able to accumulate information by the sense of touch as well as sight, let him note well the touch of his prints as they leave the toning bath. Your slowly produced batch of prints (when a bright but yellow light prevails) feel smooth and soft, but the quicker produced prints have a touch singularly different.

In the spring of this year, when I was first led to investigate the influence of actinism on the toning of the prints, I was guided by the strange sensation experienced at my finger ends when handling prints that had been produced

"I regard actinism as electricity in its primary condition, chemically active, but insensible to ordinary tests that detect free electricity."

with marvellous rapidity, and the toning flew up at a jump; the sensation was similar to that experienced when a weak galvanic circuit is completed between the body and a vessel of water and the tips of the fingers are applied to the water. Struck by the phenomenon, I cogitated again and again over the matter, and I at length felt convinced that a toning bath was, after all, a simple affair, and that toning prints was only another name for electrotyping; and if the construction of my toning bath is considered, we have an electro bath pure and simple, minus the electro power as usually applied by a battery. This last difficulty is, however, set aside if we regard the silver print as the primary motive power; and this remark leads us into the theory of toning action, which we describe briefly as follows:—

Our gold bath consists of gold, chlorine, and sodium in combination, water, free chloride of sodium, and a trace of free acid all being diffused through a volume of water; so far we have a non-actinic solution. Introduce the prints. What follows? With the gold solutions usually employed chlorine, strong and active by concentration, pitches into the silver surfaces, and, finding no free silver to gratify its appetite, nowise particular, it turns on the reduced silver, and half devours it before a sufficient layer of gold is deposited to arrest its voracious, destructive propensities. In some instances a little bleaching is advisable when extremes of contrast in the negative cause the darker portions of the print to become bronzed and buried ere the lighter are finished; but with a real good negative the slightest amount of bleaching the better. I need not here enlarge on the disadvantages found in toning with a small quantity of concentrated solution a large number of prints when each batch is toned under conditions different from those which preceded. Having had my say on this matter on a former occasion in the pages of the *Year-Book*, suffice it that I return to my toning solution to show up its more consistent behaviour. The prints are introduced, a small amount of free nitrate adhering to each print. The chlorine, proving powerless to attack the reduced silver, is content to form an alliance with the trace of free silver; the liberated gold is deposited on the print, toning action is set up and continued until the whole silver surface receives a deposit, when, if the solution is properly constructed, further toning action ceases, and the print may be removed. The minute trace of salt added with the gold serves to keep the silver in check that is introduced in the washing water or is roaming at large in the solution; it grasps the intruder, and my batch is not slow in showing that chloride of silver is only awaiting your absence to change its to-and-fro career into a drive towards the bottom of the vessel.

In concluding this paper, I would just add, that wild as some of the statements here offered might appear, they are no less facts; and facts called freaks which nature works, though true, yet seem wild fiction to those who, having eyes, think they see, yet see not through lack of searching observation.

DIRECT ANSWERS TO CORRESPONDENTS.

1. The chloride of gold I employ is that known as non-deliquest, prepared by Johnson and Matthey.
2. It matters but little if the solution discolour.
3. When a bath is fresh made and refuses to tone, do not throw away the solution, but add gold treated with hot water until the bath will tone; no difficulty will be afterwards experienced.

Other enquiries will be answered in my next, and the value of free silver in the toning bath further illustrated.

SKETCHES OF TRAVEL FROM A SUN-PAINTER'S PORTFOLIO.

BY STEPHEN THOMPSON.

No. 3.—THE LAND OF BURNS.

To wander amidst the natural scenery that a great poet has enshrined in verse is like a posthumous visit to the studio; a peep into the workshop; a turning over of the draperies and

materials which he has grouped and worked up into his pictures; the bricks and mortar with which he reared the edifice we all know so well; the dry bones which he has made to live; the background of his subjects, and the side-scenes; the "setting" of the pearl of thought—but the setting only, the framework, so to speak—that he has grouped and wreathed around his gems. The Banks O'Doon, though pretty enough, furnish but the materialities which clothe, not inspire his songs. Many another stream that flows through deep-flowered meadows, sparkling in the golden sunlight by day,—

"And to the sleeping woods all night
Singeth a quiet tune,"

would have served his purpose equally well. That sensibility which made him so alive to the beauties of external nature, at once a source of exalted pleasure and of exalted pain, would have found materials almost anywhere; the power of expression which accompanied it is a faculty for which we must seek explanation elsewhere.

In an evening walk by the banks and braes of the winding Doon, past Alloway's auld hamlet kirk and the Brig O'Doon's keystone arch, you will see many of those things which have been filtered through the mind of Burns into his verse—lassies "wi' lint-white locks," youngsters paddling i'the burn, the Castle O'Montgomery, and, may be, "the bouny blink" of some Mary's e'e, to which Burns was but too susceptible. You may see the rose and woodbine twine, hear the mavis pour its melodious song, and stroll where the milk-white thorn scents the evening gale. Cottars' "wee bit ingles" stand beneath the shadow of their appropriate tree, and were the traveller to enter one he would see the "big ha' Bible" reposing on its shelf. The hymn of praise is still Dundee's "wild warbling measure," "plaintive Martyrs," or "noble Elgin."

Burns was a true artist in his own particular walk. He knew well how to arrange his materials,—

"And rustic life and poverty
Grew beautiful beneath his touch."

His pictures are generally good in composition, nor do they lack breadth and contrast. He was very fond of the use of particular accessories—the burn, the hawthorn, the mavis notably, and the silvery birch, or "birk" (Scottish) he used inordinately, and introduces it at every opportunity. He is as much addicted to its use as Reynolds to the use of carmine and the fugitive lakes, or Turner to the use of the scarlet shadow. Nor was he wrong. The "Lady of the Woods," as Coleridge named it, lends herself gracefully to the limner—though, by the way, from its tremulousness, a very difficult tree to photograph—and for beauty and graceful delicacy well deserves the lake-poet's appellation.

Like many great poets, Burns' smaller pieces were the best. His *little* birds sang sweetest! But he could set up his easel and attack a larger canvas successfully, and *close* on his subject with no feeble grip. See his "Tam O'Shanter," and his "Cottars' Saturday Night." At the same time he was as unequal to the sustained effort of the *Idylls* or *Enoch Arden* as to the "Iliad" of Homer. Yet he seldom affected the sonnet—those little cabinet pictures that in Milton and Wordsworth's hands sparkled like mosaics—"the key with which Shakespeare unlocked his heart," Spenser's "glow-worm lamp," Dante's "myrtle leaf," and Petrarch's lute; and which, as Keats has sung, should consist of one idea well worked out,—

"The sonnet swelling loudly
Up to its climax, and then dying proudly."

Burns had an eye for colour: he tipped his wee modest daisies with crimson, and hung upon every green blade a pearl of dew. But his colour is always laid on judiciously, and every touch of the pencil tells. And what a lofty ideal he had of the inborn worth of man as man, and what a withering scorn of the selfish worldling and the pharisaical

bigot! When he worked on such subjects he dipped his brush in the "primaries," and his manipulation was terribly vigorous. He made his *bath* very acid, and got hard pictures. There was more of Gainsborough in him than of the courtly Reynolds, and with a strong dash of George Morland. But the greatest charm which haunts these banks O'Doon is that subtle sense running like an under-current through the mind wherever you tread, that Burns also trod these paths, "with his ploughman's stoop and genius flaming eye."

All this seems, perhaps, to have little to do with photography, but it serves to show that in poetry and art (in which photography may be included), although the genius of the operator is new and distinct, he has to work on the same old materials. The circling year brings seasons presenting the same types of beauty that they did in ages past. The woods and trees blossom and decay in pretty much the same way they did of yore. All nature's stock-in-trade is of the same old pattern, because incomparable from the beginning; and the human face divine, we may be sure, always presented—allowing for varieties in the dress or "setting"—much the same types of expression, because it is the passions and emotions that mould or modify its outward form and contour, and *human nature* (which, as Mr. Squeers observed, is a "run-un") has always been animated by pretty much the same desires and propensities, virtues and vices.

But all artistic workers work in the same spirit, poet or artist, ancient or modern. There is in all the same love of beauty of form, and grace, and symmetry *for its own sake*. And photography—to make a personification of it—is a young fellow of perfectly new and original genius, but, like the rest, he has to work upon old materials and old stock subjects. His range is limited, and some things he cannot do at all, not even badly. Perhaps it is a pity that others with no more eye for colour, and as little ideality or imagination, were not under the same restrictions. But what is within his range he can do inimitably well. And, moreover, he has not yet fully cultivated all the gifts he has. When he has done so will be time enough to deplore the want of others. Perhaps by that time, as the powers that be are said to add their gifts as a reward to those who have faithfully cultivated the gifts they already possess, sister Science may add a little more plasticity, remove some of his youthful restraints, grant a longer tether, and, perhaps, above all, a little more sensibility to the harmonies of colour. Ruskin says, colour should always be sterily withheld until all other technicalities are mastered, and then made the student's reward for all the uphill, preliminary labour. Perhaps if photography had that gift prematurely, greater crudities and incongruities would be perpetrated than are now laid to his charge. We know not what latent powers may reside in certain substances under certain conditions, as unknown and unsuspected as those which lay dormant for centuries in the substance known as horn-silver, that blackened on exposure to light, but which the alchemists of old could make nothing of, handling the fact as a monkey does a watch—examining it, peering into it, and finally laying it down with a puzzled air.

Burns' land is very accessible ground from Glasgow for the tourist. The subjects are well together, and are lighted at different periods of the day, so that he may be certain of some of them. "Alloway's auld haunted kirk" is a morning subject, and requires a lens of very wide angle, the kirkyard is so small. "Burns' monument" is due about noon or later. The "Auld Brig O'Doon" makes an excellent subject, both from the river-side and the new brig, but requires a lens of long focus. It is good from 3 p.m. until sundown. "Burns' Cottage" is half a mile from the other subjects, and is due in the morning later than Alloway kirk. There are some pretty bits farther up the Doon, but it requires some thoughtful prospecting as to composition, &c., which should be done on the day or evening before.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XXX.

"With respect to the conduct necessary to be pursued in obtaining this advantageous distribution of the lights and darks in a picture, there is little now can be said upon it, as our neighbours on the Continent have long since developed the principles of practice adopted by the great chiaroscuro-ists."—*Barry*.

CHIAROSCURO—(continued).—PORTRAITURE.

In portraiture the chiaroscuro is to a very considerable extent under the control of the artist; there is, therefore, not so much excuse for imperfect and faulty lighting as there is in landscape photography.

The tendency of the lighting in photographic portraiture has been to harsh patches of black and white, or to miserable softness, full, it is true, of delicacy and half tone, but insipid and without character. Neither of these varieties possess what could be strictly called chiaroscuro, which term implies some notion of the arrangement and management of light and shade. The extreme popularity of M. Adam-Salomon's pictures in the Paris Exhibition seems to have made photographers alive to the fact that there is something more in light and shade than what is shown in the modelling of a face. It is this last subject, however, that we will first consider.

The object to be attained in lighting a head, considered as a head only, without reference to the general effect of the picture, is roundness and a certain degree of relief, not the relief attained by the stereoscope, but that degree of projection which is seen in all good pictures. How to obtain this relief shall be our next consideration. It will first be necessary to say a few words on the studio in which the portrait is produced. The general details of a glass house have been so often explained that for my present purpose it is sufficient to say that in these remarks I refer to a ridge-roof studio, one side (the south) of which, up to the ridge, is opaque, the other half glass to within a few feet of the floor. I make no reference to tunnels, in which I do not believe, and which are only available in the hands of men who will make good pictures in spite of, and not because of, the difficulties with which they have to contend.

The glass side of the roof may be blocked up permanently for five feet from each end; the remaining space of glass should be divided into four widths, covered with white blinds on spring rollers, pulling down from the top. I do not think blue or black blinds in addition of any consequence; they only produce complication and disorder. The side, also, if the studio is so situated that it receives light through it direct from the sky, should have corresponding blinds; but if the light reflected from buildings only is admitted, then the blinds are not necessary, this kind of light being very weak and ineffective in comparison with that from the sky.

We will suppose the south wall to be papered or coloured with a middle tint of a grey or greenish-grey colour—the studio will then be ready for making experiments in light and shade on the face. To assist further description, I give

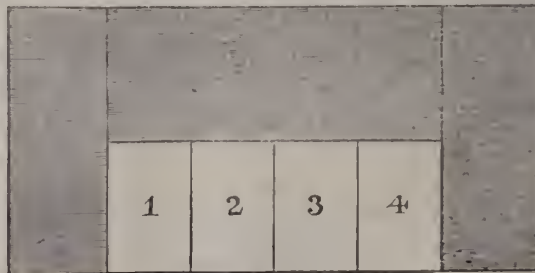


Fig. 1.

a plan of the roof, premising that the size of the floor is 28 feet by 14 feet.

Place a sitter in the usual position; or, perhaps, a marble

bust will be better, because you can look it more steadily in the face, and it will not tire with your prolonged study and observation. Turn the face to the light, and let all the blinds be up, so that it may fall full upon it. The consequence will be that the features will appear faint and indistinct, or very much in the condition Queen Elizabeth would have preferred to have been taken, without shadow. If the head is now turned away from the light until it presents a three-quarter view to an observer standing where the camera is usually placed, the off-side of the face will appear in agreeable shadow, and the nose and other features will stand out in relief. But the best effect is not yet obtained. Although the light is broad, and relief is got, the light is too broad and flat, and there is not sufficient subtlety or delicacy in the gradations in the lights, and not enough transparency in the shadows; the photograph would consequently have a harsh black-and-white effect. If all the white blinds are drawn down about one-third of the roof space, the shadowed side of the face will appear softer and more in harmony with the light. We have now to produce the greatest amount of gradations in the lights. This is done by drawing down the two curtains (1 and 2) farthest from the sitter. It will now be found that the shining lights down the nose, on the forehead, and other parts, are produced to perfection, and that all gradations, from opacity to bare glass, to speak photographically, are to be seen on the bust, and that the whole face receives its proper projection and relief.

It will be thought by some that to exclude light in the manner described will prolong exposure, but experience teaches that the truth lies the other way. A properly lighted head does not take a longer exposure than one on which the fullest light attainable in the studio is thrown, and the results are not to be compared.

If it is considered desirable to take the head more inclining to profile, or if the sitter has features that project very considerably, the shadowed side will be found to be too dark. In this case reflectors are sometimes employed. This I think an objectionable proceeding. Any reflection giving more light than the natural reflection from the grey wall I have described will produce a second spark of light in the eye, which has a very disagreeable effect. A much better method is to work diagonally across the studio, as shown in fig. 2.

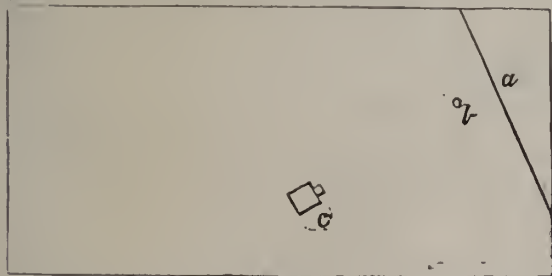


Fig. 2.

In this arrangement the background (a) is placed aslant; the sitter (b) is seen from the camera (c) in a fuller light, but still with a three-quarter view; the shadows of the nose will be stronger, but confined to a less space, and the shadowed side of the face will be lighter. This arrangement is also very suitable for an exact profile, or one showing a glimpse of the off eye.

In a photograph of a well-lighted head will be seen the extremes of white and black in small quantity united by masses of ever-varying gradation. The extreme value of black and white in minute but visible quantity was never better stated than by Ruskin in the following passage, which, although it refers to colour, states the case as regards light and shade equally well:—

"Next, respecting general tone. I said just now, that, for the sake of students, my tax should not be laid on black and white pigments; but if you mean to be a colourist, you must lay a tax on them yourself when you begin to use

true colour; that is to say, you must use them little, and make of them much. There is no better test of your colour tones being good than your having made the white in your picture precious, and the black conspicuous.

"I say, first, the white precious. I do not mean merely glittering or brilliant; it is easy to scratch white sea-gulls out of black clouds, and dot clumsy foliage with chalky dew; but when white is well managed, it ought to be strangely delicious—tender as well as bright—like inlaid mother-of-pearl or white roses washed in milk. The eye ought to seek it for rest, brilliant though it may be, and not to feel it as a space of strange, heavenly paleness in the midst of the flashing of the colours. This effect you can only reach by general depth of middle tint, by absolutely refusing to allow any white to exist except where you need it, and by keeping the white itself subdued with grey, except at a few points of chief lustre.

"Secondly, you must make the black conspicuous. However small a point of black may be, it ought to catch the eye, otherwise your work is too heavy in the shadow. All the ordinary shadows should be of some colour, never black nor approaching black; they should be evidently and always of a luminous nature, and the black should look strange among them; never occurring except in a black object, or in small points indicative of intense shade in the very centre of masses of shadow.

LIKENESS IN PORTRAITURE—LIABILITY OF SITTERS.

A CASE of considerable interest to professional photographers is reported in the *Sussex Express*, as having been recently tried in Westminster County Court:—

An action was brought by Messrs. Manll and Polyblank, photographers, of Piccadilly and Fulham Road, Brompton, to recover the sum of £8 17s. 6d., being the price of an enlarged photographic portrait of Mr. Rhodes, the defendant, who is a gentleman of some property, well known in Brighton, which they had painted in oil. Mr. Minton appeared for the plaintiffs; Mr. E. C. Willoughby, instructed by Mr. Robert Warren, of Golden Square, London, represented the defendant.

It appeared from the evidence of a number of witnesses called by the plaintiffs, that the order for the picture in question was given some time in August, 1866; that, on its being sent home, the defendant was dissatisfied with it, chiefly on account of the high colour on the face, and what he considered a cynical expression.

The artist was called, and stated he took the portrait from a smaller photograph, which was enlarged and then painted in oil. He could not say that he gave the subject a sitting prior to the complaints made, and in explanation of the variation of the colouring of the hair and whiskers in the portrait from the original, he stated he received general instructions to soften and tone down the ravages of age, and that the final sitting was important to give a "pleasant touch up," in other words, to put a pleasing expression on the face of the sitter. All the witnesses agreed in the opinion the likeness was a flattering and an agreeable one, and was done in a workmanlike manner.

After several attempts at alteration the defendant returned it as not being a proper likeness, and hence these proceedings.

Mr. E. C. Willoughby, on behalf of the defendant, stated he did not dispute either that the picture was a good one as a work of art, or that it was worth the money. The sole question was whether it was a likeness or not. The learned counsel suggested that the law was the same in this as in every case where the buyer relies upon the seller's judgment and skill; the latter impliedly warrants the article furnished shall be reasonably fit and proper for the purpose for which it is required. So here, an artist who agrees to paint a likeness is bound by his contract to supply what is a *likeness*—not a resemblance or a caricature. He then cited two cases; one where Sir Edwin Landseer had returned to his tailor a dress-coat because it did not fit him, being so humpy at the shoulders as to make him (if he had worn it) an object of ridicule at the Royal Academy dinner; and another where Madlle. Pictiens, the celebrated singer, had refused a statuette, as it was an indifferent likeness. In both cases the learned judge told the

jury that where persons paid a good price for an article, relying on the seller's skill and judgment, they had a right to expect their money's worth, and he left it to the jury to say whether the contract had been fulfilled. In both the verdict was for the defendant. So here, what with the flattering alterations and the "pleasant touch up," the real character of the features was departed from, and though an excellent work was produced, yet it was not a likeness of the defendant, but what one sees in the Academy at this season, "a portrait of a gentleman unknown."

Mr. Rhodes, who is a fine and good-looking man, was called as a witness, and was carefully scrutinized by the learned judge, who compared his features with those on the smaller photograph, and the oil painting. Mr. Rhodes stated that the portrait was required for his mother, and was rejected by his family on the sole ground that it was not a likeness. He sat several times after to the artist for the purpose of alterations, but finding it was no better, but rather worse, he declined to accept the picture. He distinctly denied he ever told the artist to give him a "pleasant touch up," denouncing this expression as photographic slang.

The learned judge, in giving judgment, said this was a very important case, and he was rather sorry he was left alone to decide it. He quite agreed with many of the observations for the defence. It really was a very narrow issue. Was the oil-painting a likeness of the defendant or a good copy of the small *carte-de-visite*? The *carte-de-visite* was an excellent likeness; it was admitted that the oil portrait was to follow this. It seemed to him it did not do so; none of the features were preserved in their integrity; and, in fact, he could barely identify a single one. Under these circumstances he could not say it was a likeness, or the contract carried out, and in his opinion the defendant was not bound to receive it. His judgment would be for the defendant.

A CHAPTER IN THE EARLY HISTORY OF PHOTOGRAPHY.

Our excellent Philadelphia contemporary recently contained a report of a meeting of the photographic section of the American Institute, at which the early history of photographic portraiture came under attention. As there appears to be considerable disagreement in the statement of facts by different authorities, and exactitude in the history of every step in our art is matter of interest, it seems desirable, if possible, that the state of the case should be ascertained whilst many of the actors in the scenes are still alive to tell the story. The origin of this discussion is as follows:—A short time ago a letter addressed to Mr. Peter Le Neve Foster was published, and this letter was read at this meeting of the Institute in question. Upon this Mr. J. Johnson, a gentleman intimately associated with the early history of the art, made a statement in which he takes exception to Mr. Claudet's facts in terms of somewhat scant courtesy. The letter which follows was sent in reply to a letter from Mr. Foster congratulating Mr. Claudet on the receipt of a second honour:—

MY DEAR FOSTER,—Immediately on the discovery of Daguerre, I went to Paris, saw him, and bought from him the first licence to work out his process under the patent he had taken in England. I came back, brought all the specimens I could procure—made by his pupils, for he was attending once a week at the *Conservatoire des Arts et Metiers*—to instruct all the adepts and give them the information they wanted to master the process. I sent to the Royal Society's soirées the best specimens, after having submitted a collection of them to the Queen, who kept the best of them.

At that time, and without any authority from the patentee, the Polytechnic Institution took up the subject as an advantageous one to give lectures upon; and Mr. Goddard, a chemist in the employment of the Institution, explained every day the process to visitors, illustrating it by taking Daguerreotype pictures of a white bust before the audience.

Then, without a licence, and in defiance of the patentee, Mr. Beard, having bought an American invention by which, substituting a large concave mirror for the object-glass of Daguerre, found it was possible to operate upon a very small plate placed in the focus of the mirror, with a greater rapidity than by Daguerre's plan. Beard was allowed by the Polytechnic Institution to erect on the top of the building a glass room, and he began to take portraits by the said American photographic process. He intentionally dropped

the name "Daguerreotype." You recollect the success and popularity of the process.

In the meantime, wishing to work out my license, I treated with the proprietors of the Adelaide Gallery, and I erected on the top of the building a glass room and all that was necessary; but I could not use the patented mirror, so that I was obliged to do the best I could with Daguerre's slow object-glass. I went on so during 1840.

Early in 1841 I communicated to the Royal Society my discovery that chloride of iodine and chloride of bromine, added to the preparation of Daguerre (iodide of silver), was capable of rendering the original process one hundred times more sensitive, and from that moment I obtained instantaneous Daguerreotype pictures—as much so as with the present process of photography. My discovery made a great sensation in France, and every one took up the process, for which I had not taken out a patent.

But I must not omit to state that Goddard had made some experiments on the application of bromine, and that before my paper was read at the Royal Society it appears he had sent to the Royal Society a sealed paper, in which he had described the accelerative property of bromine. I believe that it was so; but my discovery was the only one (being published and public) by which the photographic world could practise a very quick process; and, in publishing fit to the Royal Society, I gave all the information and directions necessary to practise it.

Not long after Beard had taken up the American photographic process, Daguerre instructed his agent in London to find a buyer for his English patent. By my license he was bound to give me the option of refusal. My partner, not understanding the future of photography, would not consent to our buying the whole patent for £800, which was the price asked by Daguerre. I was obliged to decline the offer; and Daguerre's agent having made known to Beard the terms of the purchase of the patent, the latter wide-awake speculator was too glad to accept the offer, particularly, thinking that in buying the patent he could withdraw my license. This gave rise to a very long and expensive action in Chancery, which was at last decided in my favour, and Beard had to pay the whole expense.

During the year after Beard had bought the patent, he sold licenses to all country towns to the amount of £36,000!! This I know as certain from Johnson, who was interested with Beard, having sold him part of his patent for the concave mirror, of which Johnson was the inventor. I have told you more than you probably wanted, but I could not help giving you the whole story.

A. CLAUDET.

Mr. John Johnson, of Saco, Maine, being present at the meeting, stated that this contribution to the "History of Photography" contained statements so wide from and at variance with the truth, it might not be out of place to endeavour to show wherein A. Claudet is unreliable, historically.

At the suggestion of John Johnson, in New York, United States, in October, 1839, Alexander S. Woolcott joined him to prosecute the Daguerrean art. In this month and year the first Daguerrean portrait from nature was taken by Woolcott and Johnson.

On the 3rd of February, 1840, William S. Johnson (the father of John) sailed for London, and reached there about the close of the month, and immediately thereafter had an interview with Richard Beard, Esq., and with whom an agreement was entered into for the patenting of the mirror camera (the invention of Woolcott) in England.

The issue of this patent was opposed by Daguerre's agent in London; the opposition to the issuing of the patent for the mirror was withdrawn on Beard and Johnson agreeing to pay Daguerre £150 per annum for the right to employ and use all pertaining to the Daguerrean art, chemically, patented by Daguerre.

Mr. Claudet undoubtedly went to Paris; he was the first to obtain a licence from Daguerre (through an agent); his licence was for the use of three cameras anywhere in England, paying the sum of £200 therefor. It was thought the British Government would purchase the entire patent of Daguerre; if not, Claudet should have the first right to purchase the entire patent for £900 more. On the other hand, if any other party (Claudet not becoming the purchaser within the time prescribed) purchased the entire remaining interest, Claudet was bound in honour to receive his purchase money, and to deed to Richard Beard (for himself and Johnson) the license he held; but he thought differently, and an expensive Chancery suit was instituted; the subsequent failure of Beard doubtless terminated the litigation, leaving Claudet, without doubt, to foot the bills.

Richard Beard, Esq., paid £200 and expenses for one-half of the American invention; the remaining half, with all profits, he purchased for £7,000 at twelve months from the issuing of the American patent in London.

John Goddard, before being in the employ of Richard Beard and William S. Johnson, was an employé of the Adelaide Gallery Association as a lecturer in the department of light, demonstrating, with the aid of the magic-lantern, the physical proportion of light; he was in no sense a chemist, and did not profess to be.

In March, 1840, Wolcott and Johnson opened in New York city the first Daguerrean portrait gallery of the world.

In October, 1840, John Johnson (the speaker), at the solicitation of Richard Beard and William S. Johnson, sailed for and arrived in London about the middle of October, for the purpose of aiding to upbuild the English enterprise.

Wolcott and John Johnson, from the time of the departure of Mr. William S. Johnson, conveyed by letter, &c., to Beard and Johnson, in London, every detail of experiments, arrangement of light, discoveries, applications, and improvements.

John Johnson, it will be seen, had been engaged a twelve-month in the art before sailing for Europe—seven months at practical portrait taking in the gallery at New York.

The high latitude of London, and the shortness of the days, with the feeble actinic power, even in October, there made it apparent, in an eminent degree, to a New Yorker, that a renewed effort should, if possible, develop by chemical means a shorter sitting.

To this end I worked diligently, succeeding, by the discovery and application of chloride of iodine, in effecting the desired result, toward the close of November or early in December, 1840; Dimond and Co. (per Mr. Turner), of Holborn Bars, London, preparing whatever was ordered for my use.

In March, 1841, Richard Beard opened his Daguerrean gallery at the Polytechnic Institute. By reference to the publications of that date, it will be seen that the enterprise was no longer a doubtful one, my chloride of iodine producing results highly satisfactory, as it had months before in New York City, I having communicated the discovery to Mr. Wolcott, then in New York.

John Goddard, of London, was in the employ of Beard and Johnson, at Holborn Bars, and at the Polytechnic, and claimed to have made a discovery in the application and use of chemicals to the Daguerreotype.

For several months he and I worked in the same gallery, each using their own preparation of chemicals; his was marked "A. and B." The nature of his, as conveyed to me by himself, consisted in adding iodus and iodic acid to iodine.

If Mr. Goddard ever used bromine with iodine, he failed in its application as an accelerator, for in no instance did he ever produce results more speedy—using the same camera with myself—than those pictures produced by myself with chloride of iodine.

In the early part of 1841 much of my personal time was devoted to the planning and constructing of the operating room and building at the Polytechnic Institute, London, and looking after the blue plate glass for its skylight, in plate-glass works in Lancashire, &c.

After months of working in London, I was despatched to other cities and towns to aid in opening other galleries, William S. Johnson taking general charge of the manufactory, and assisting generally in all that pertained to this art and enterprise.

In October, 1841, John Johnson returned to the United States, and soon thereafter discovered and used chloride of bromine, and at once forwarded the formula to A. S. Wolcott (who had, in the previous July, gone to London to take charge of the optical, chemical, and mechanical details). Mr. Wolcott manufactured chloride of bromine in London, and it was sold and distributed throughout England as "Wolcott's Mixture," and it prevailed as a successful and needed chemical.

Claudet reports that "Johnson" had told him that Beard had sold licenses to the amount of £36,000, and adds: "This I know as certain, from Johnson, who was interested with Beard, having sold part of his patent for the concave mirror, of which Johnson was the inventor." Wolcott invented the concave mirror in its application to the Daguerreotype, and I am certain that "Johnson" never informed Claudet or reported that £36,000 were received, for no such sum was ever received from licenses and sales.

Months after Beard opened the rooms at the Polytechnic Institute, he, with the consent and wish of both Johnsons, purchased all Daguerre's interest in his patent, and was assured, on paying £200 to the agent, that Claudet would deed to him (Beard) all his right by paying £200 therefor. Claudet, how-

ever declined; legal proceedings were had, resulting as before stated.

A brief summary, then, would show that Johnson and Wolcott took the first Daguerrean portraits from life, established the first public gallery in the United States, and subsequently, through their labours, opened the first one in England; that John Johnson, in 1840, discovered, used, and applied chloride of iodine in England; that Wolcott soon thereafter made it public in America; that Claudet opened a gallery at the Adelaide Institute in 1841, months after Beard had been in full work. Claudet's "instantaneous" pictures were myths; instantaneous pictures could not be had by those sent to sit for them. Beard worked not "without a licence, and in defiance of the patentee!" but with one granted months in advance of any real need of its use.

John Goddard was a lecturer, not a chemist, at the Adelaide Gallery, before being employed by Beard and Johnson.

The process introduced by Beard and Johnson was always considered as substantially that of Daguerre, and his name was never "intentionally dropped."

If Claudet worked at all in 1840, it was not for the public; the records should prove when he opened his gallery, and the time of a sitting, and as to the time of the application of both chloride of iodine and chloride of bromine.

Goddard was sent to France to obtain the great secret and possess himself of the required chemicals that had been heralded as "instantaneous;" on returning, however, he brought with him a camera possessing the wonderful property of instantly producing the work!!

Goddard's bromine combination—if, indeed, he ever used it—failed to produce faster action than that of chloride of iodine, discovered and used by John Johnson.

Had Claudet acted in good faith, there would have been no Chancery suit. Daguerre complied with the terms of his agreement, either that Claudet should purchase the entire patent, or yield to that other who should the licence he held, by being refunded the purchase money; and, finally, to prove to the British public his far-seeing, Mr. Claudet greatly magnifies the sum Mr. Beard had received, and endeavours to qualify it by answering his "Dear Reader" that Johnson, "the inventor of the concave mirror" (of which he was not the inventor), had so informed him; it not being true: Johnson did not so inform Claudet.

"The whole story" is too jumbled a mass to pass for history of "great interest," or contribution to the "History of Photography."

Correspondence.

PHOTOGRAPHIC NOTES ON THE CONTINENT.

[FROM A SPECIAL CORRESPONDENT.]

Heiligenblut, 13th August, 1868.

I HAD intended to have written from Salzburg, but wishing to join a party of pedestrians who were contemplating a knapsack tour through the Tyrol, I was compelled to leave that town rather earlier than I had expected. I am now writing from a small village in the Puster Valley, at the foot of the *Grosse Glockner*, known as the Chamounix of the Tyrol, and as we are just now awaiting the dispersion of hazy weather before we can ascend to the glaciers, I seize the opportunity of sending you a few notes made since I left Vienna.

In a previous letter I mentioned the practice which obtained very greatly in some parts of Germany, of selling photographs of engravings, of landscapes, &c., as original photographs. When I made this statement I imagined the custom was confined to smaller towns and out-of-the-way places only, and I was very much astonished indeed to find that at Vienna and Salzburg, both of which towns are especially noted for their good photography, these spurious articles were largely sold. At Vienna, where I was very anxious to obtain some pictures of the Danube and other localities of interest, it may be stated that at the shops of the largest photographic dealers fully one-half of the smaller pictures were reproductions of engravings. There is, of course, no harm in selling a photograph of a wood-cut

or engraving if the same is sold as such to the public, but in most cases the latter believe the print to be really a genuine picture taken direct by the camera from nature.

The landscape photographs exhibited at Salzburg are decidedly superior to those shown at Vienna. In the last-named town, with the exception of a few pictures, of mediocre quality, of various places of interest in the vicinity, there was nothing whatever to be seen; all photographic talent was concentrated upon portraiture (certainly with great success), and landscape work overlooked altogether. In Salzburg, however, some very fine pictures may be seen of the Salzkammergut and Tyrol, taken mostly by MM. Baldi and Wurthle. A photograph of the *Koenig See*, and another of the principal square at Salzburg, were particularly good. No scenes on the Danube were, however, to be obtained, and it certainly seems passing strange that while the Rhine has been worn out and done to death by photographers, none of the clever followers of the art who live actually upon its shores or in its immediate vicinity should have deemed it worth their while to have reproduced some of the many beautiful spots which adorn the greatest, if not the finest, of European rivers.

Bad Gastein, through which I passed on my way here, seems very much in the same position as Ischl as regards photography. It is one of the most fashionable and expensive spas in Austria, and yet I did not actually see one photographic studio in the place. Views of the mountains, waterfalls, and points of interest in the neighbourhood were exhibited for sale in the bazaar and at the shops, but where one photograph was to be seen, twenty of the old tinted exaggerated pictures were shown.

With regard to the prices charged at Salzburg and Vienna for cabinet and card pictures, they are certainly very low. The highest price quoted for cabinets was ten florins for half a dozen, while the general price at first-rate artists was but six florins (a florin being equal to about one shilling and ninepence). Carte-de-visite pictures varied from twelve and eight florins per dozen downwards, articles of a very good description indeed being obtainable at six and five florins per dozen.

In Salzburg the specimens exhibited in the show-cases betrayed, in more than one instance, unmistakable signs of fading and yellowness. Some of them had been so imperfectly washed, that not only were the whites utterly destroyed, but the pictures themselves were rapidly disappearing. From this it would seem that our neighbours on this side of the Channel were not more fortunate than ourselves in producing durable and imperishable silver prints. No specimens of the carbon process or of photo-lithography did I see in any of the establishments that I visited.

The scenery in this part of the country is truly magnificent, and the extensive views to be obtained in making one's way here from Gastein, over two mountain passes 9,000 feet above the sea, and a glacier more than two miles broad, are among the most beautiful I have ever seen. The landscape is very wild and uncultivated, and the neighbourhood thinly populated. On the paths at every half mile, or thereabouts, are erected small chapels or crucifixes (the people are Catholics), and these of the most crude description. Some of them are indeed so imperfect as to remind one very much of the photographs recently taken in Abyssinia of pictures from native bibles. Besides the religious erections before mentioned, the roads are plentifully studded with rude paintings of fatal accidents which have happened in the vicinity, such as a man falling from a precipice or into a stream, or perishing in the snow. These productions are quite peculiar to the district, and are so numerous (for many of them date fifty years back) that I have counted as many as thirteen in one day's journey.

I must not conclude this letter before mentioning two very beautiful optical effects which I witnessed a day or two ago. The first was the formation of a perfect rainbow in the spray of a large waterfall, which could be seen, so our guide informed us, only between six and eight o'clock in

the morning, when the sun's rays fell upon the fall in a certain direction. All the colours were very clearly rendered, the violet band being very marked indeed.

The other optical spectacle was even more striking. A swift stream ran between two mountain walls of considerable height, which at one time bent round so as to form a right angle. A narrow path had been cut into the side of the rock at some distance above the stream, whence the rapid current might be seen foaming and chafing below. The sunlight fell direct upon the water until the latter turned the angle, when it came under the deep shadow of the rock. The current, however, carried the sunlight with it beyond the angle into the more sombre portion of the chasm, where it appeared like a stream of molten silver flowing from a furnace and illuminating the objects in its immediate vicinity.

WHITE PIGMENT IN CARBON PRINTING.

SIR,—I understand that Mr. Blair has just invented a new carbon process which, a friend assures me, is to supersede all processes at present in existence. The new process consists, I understand, in the use of a white pigment on a black ground, instead of a black pigment on a white ground. If I am not much mistaken, such a process was proposed by some one in your own pages some years ago, and condemned subsequently by Mr. Carey Lea as impracticable, because almost any white pigment which could be used would be likely to decompose the sensitive salts. If such a process be practical, the credit of the suggestion is due to your original correspondent, whose name I forget. My chief object in writing now is to suggest that, whilst many white pigments—such as oxide of zinc, carbonate of lime, &c.—might decompose the chromic salt, it seems likely that kaolin might have no such action, and would probably form a good pigment for the purpose.

By the way, did not Mr. Blair propose the method of exposing carbon prints at the back after some person else had published precisely the same thing? Is he in the habit of making, as "original," suggestions which others have already published?—Very truly,
Z.

[The suggestion to which you refer was made by Mr. Frank Eliot in our issue for June 17, 1864, in an article entitled "Suggestions for a New Pigment Process." Mr. Carey Lea has recently referred to the same idea as worth consideration, having doubtless thought better of the matter since 1864. Mr. Eliot's suggestion was to use a white pigment on black paper, employing M. Poitevin's process with gelatine, perchloride of iron, and tartaric acid. You will find it noted in our recently published work. Mr. Burnett was the first person to definitely point out the necessity of exposing a carbon print on one side and washing away at the other, although it had been somewhat indefinitely referred to by the Abbé Laborde. Mr. Blair published shortly after Mr. Burnett, and, as we have no doubt, without any knowledge that the idea had already been published. Mr. Blair has been, we believe, a hard-working and conscientious experimentalist in carbon; that he has occasionally made suggestions which had already been published is probably due to insufficient familiarity with the current photographic literature, which would keep him informed on the progress of the art.—Ed.]

Talk in the Studio.

KEEPING QUALITIES OF GUM PLATES.—In a letter just received from Mr. Russell Manners Gordon, who is in North Wales, he observes, in relation to some of the gum plates he has been trying, that they keep perfectly for six months (and how much longer requires to be ascertained) after exposure and before development. The only change (if any) is the improvement in quality. We do not know any other dry plate of which such a statement can be made.

NEW PRESERVATIVE FOR COLLODIO-BROMIDE PLATES.—The new preservative, the results of which were recently described at a meeting of the Liverpool Amateur Society by Mr. Bolton, consists of quassia and sugar. One ounce of quassia chips and 200 grains of sugar are macerated for a few hours in water, which is poured over them in a boiling state. The solution is then strained, and is ready for application to the collodio-bromide plate. The addition of albumen to this solution, in the proportion of a drachm to a pint, Mr. Bolton thinks an improvement. The advantage of the new preservative is increased sensitiveness. It is probable that the preservative might be applied with advantage to plates prepared with bromo-iodized collodion, and excited in the usual way.

FULMINATING SILVER.—M. Couvreur recently addressed a letter to the French Photographic Society, stating that in evaporating a bath of nitrate of silver in which a portion of the water had been replaced by alcohol, he noticed a white light precipitate, and hastily removing the capsule from the fire he recognized in the filtrate fulminate of silver. He fortunately removed it from the fire in time to prevent an explosion.

INFORMERS AND PIRATES.—We find various comments expressed on the subject. Whilst all persons sympathize with Mr. Graves in regard to the deep wrong he has suffered from photographic pirates, almost all regret that questionable means should be used to serve a right cause. The *Stationer* says:—"In reference to the spy system, it occurs to us as very peculiar that the persons who have been heretofore prosecuted have not thought of the Act 11 and 12 Vic., cap. 43, sec. 5, which recites that "every person who shall counsel or procure the commission of any offence punishable on summary conviction shall be liable to be proceeded against and convicted of the same, either together with the principal offender, or before or after his conviction." In the case of the hawkers, it is worthy of note that the fine was inflicted for an offence committed at Portsmouth so long ago as the 27th December last! When the Act of Parliament was passed which required process to be issued within six months after the commission of an offence, it surely was never intended that delinquents should be subjected to the law for that period after the discovery of the fraud? Mr. Graves, as we have said in prior issues, is quite right to protect his own interests, but we strongly object to his delaying the prosecutions for so long a period as six months. In all other criminal indictments it is considered incorrect unless a prosecutor takes immediate process. And such a feeling is correct, because, were it otherwise, it would hold out a premium for persecution, and enable malicious persons to practise the *lex talionis* in a manner that could not fail to produce injurious social effects.

PRECIPITATE OF CHLORIDE OF SILVER.—Dr. Vogel says:—"Not long ago we had a discussion in our Photographic Society on a proper method to facilitate the precipitations of chloride of silver from the waste water containing silver salt in solution. It is curious that sometimes days, and even weeks, will elapse before all the chloride of silver has been precipitated, and particularly is this the case in those printing establishments where the pictures are pasted with gum arabic to the negatives; the gum finds its way into the water and retards precipitation. Other organic substances have a similar retarding influence. The best practical remedy appears to be, to mix a couple of pounds of nitric acid with the waste water, or some hot water."

FIVE HUNDRED DOLLARS PRIZE.—A medical journal in Philadelphia says that a correspondent has authorized the editor to offer a prize of 500 dollars for an improvement in photo-micrography. He says:—"To advance science, facilitate research, further our knowledge of diseases, at the meeting of the American Medical Association, in 1869, through the award of a committee, I will tender a prize of five hundred dollars for an improvement on the micro-spectroscope. I am anxious to have invented and perfected a micro-photographic apparatus for scientific purposes—a compound microscope, with an attachment so arranged that it will afford the investigator a complete photographic representation, or spectrum, of all microscopical bodies placed within the field of vision. Such an instrument would be an achievement in science; we could read direct from the type true pathology. It would be obvious to all. It would reveal many of the mysteries of nature in morbid agency. It would aid us in etiology and histology. It would afford advantages in the study of organic and inorganic chemistry. We could observe the changes produced by a diathesis—determine the faults in rheumatism and gout. We could also mark the developments and progress of pyogenic,

septic, and zymotic diseases. I want an instrument simplified, with power sufficient to print animality, from the larger animalcula down to the minute microphite. The micro-photographs thus taken could be readily magnified if desired. The premium should be open to all competitors, at home or abroad. Without invidiousness, I respectfully nominate Professors Joseph H. Leidy, University of Pennsylvania; Christopher Johnston, University of Maryland; and Austin Flint, Jr., Bellevue Hospital Medical College, New York, as the committee to determine the award to the inventor of the best instrument."

RELIEF IN ART.—A daily contemporary, in noticing some paintings in which the artist had endeavoured to secure unusual roundness and relief in his pictures, emulating in some degree the effect of the stereoscope, says: "But grave authorities on art matters have decided that this perfection of imitation is not the true aim of painting; but, on the contrary, that the pencil should be taught to reject minor details, which detract from the great whole which a composition should always assume; that the painter should depict what he beholds in the mirror of the imagination, rather than make a minute transcript of objects as they appear to keen critical eyes. Painting is a creative art. Genius will often realize, by a few strokes of the pencil, ideas and effects full of pathos and dramatic power, which the more imitator could not rival by excessive labour. It must always be understood that a Demosthenic-like fidelity and a stereoscopic-like relief are not regarded as beauties by those who have thought much and written much about the great art of painting."

ANTIDOTE TO VEGETABLE POISONS.—The Coroner stated, at a recent inquest, that if powdered charcoal were administered, it would often prove an antidote to irritant vegetable poisons like aconite.

To Correspondents.

A YOUNG PHOTOGRAPHER.—The lower part of your negative being fogged whilst the top part is quite clear and clean suggests that the defect is due to diffused light entering the dark slide through the aperture at the top when the shutter is drawn up. The light in such case would fog the bottom part of the negative, which, whilst in the dark slide, is of course uppermost. In taking a portrait in a sitting-room the window should not be opposite your lens. The best mode of proceeding is to place the sitter with his side-face to the window, the front-face, perhaps, a little inclining towards it. The sitter should be placed about three feet from the window. The camera, then, being placed as close as possible to the wall in which the window is pierced, will be slightly directed from the light rather than towards it.

PURGEON.—First cleanse the brass-work thoroughly, then apply what is called "chemical bronze." It consists of a solution of bi-chloride of platinum 4 drachms, and nitrate of silver 1 grain, in 6 ounces of water. Apply with a camel-hair pencil. When the requisite blackness is obtained, wash the brass with water, and, after drying, polish with blacklead. A preparation made of old Daguerrotype plates, consisting of silver and copper, dissolved in dilute nitric acid, and applied to the brass, which should first be cleaned and made very hot, is said to give a good black to brass. 2. The black precipitate in your toning bath is probably reduced gold. Filter it out, and preserve it with your gold residues, to be reconverted into chloride of gold. More than ten sheets of paper ought certainly to be toned with 15 grains of chloride of gold.

T. W. M.—The general form of your studio seems good, and it ought to give good results; but you have less light than we should think desirable, especially as it seems divided into narrow panes, the sash-frames in such case interrupting the passage of a good deal of the light which should reach the sitter. We should prefer four feet more at the top on the north side, and a couple of feet more side-light at the north. This will probably enable you to illumine your shadows better.

H. R. S.—The card group is not bad, but it might have been better. It would have been better, in a group of three figures, to have avoided giving the full-face of each; if one had been in profile, or nearly so, the effect would have been more pleasing. Neither should every face have been looking into the camera. If the little one now sitting on the floor had been kneeling and reclining against its sister the result would have been better, we think. The chemical qualities are not bad, but there is a little tendency to hardness and chalkiness. On examining the group, and thinking over these suggestions, you will agree with them.

W. L. S.—We have not met with a paper giving those singular transparent, greasy-looking spots when wet. We should think the defect was in the original paper. Can you let us have a sample

- of the unsensitized paper in which it occurs? Have you noticed the defect in the paper before printing?
- J. H. M. (Exeter).**—The Copyright Act forbids "copying" copyright pictures as well as selling them. We do not suppose that the owner of any copyright would take proceedings against an amateur copying for his own use; but he could do it. 2. A trace of iodine in an iron developer will tend to check fog. Such a check would not be required with the gelatino-iron developer, as the gelatine generally effectually prevents fog. 3. The stain to which you refer is, if we rightly understand you, a matt silver stain, and is, in the case described, probably due to contact with the inner frame, from which some particles, having a reducing action, have been drawn on to the surface of the plate by capillary attraction. 4. The prints enclosed lack a little vigour, but whether this is due to a weak bath or a thin negative we cannot say. The lighting of the figures is good. As prints, a little more warmth and vigour would be an improvement. Thanks for the design, which we shall carefully consider. We shall be glad to hear anything further regarding it.
- DAVID THOMAS.**—Marion's transparent pellicle, to which we referred some time ago as having the characteristics of flexible glass, is perfectly smooth, polished, and transparent, like glass.
- A. TAYLOR.**—When a collodion is sold as prepared for iron development, it is meant that the iron development should be employed in the wet process. If the collodion be employed in a dry process, then the most suitable development for the process must be employed, and in Mr. England's process you must, of course, adopt the kind of development he recommends. The collodion you mention may be used for his process; but it will be better for the purpose if you add 1 grain per ounce of bromide of cadmium.
- J. R. WAITE.**—We have despatched the letter. Mr. Hingley's address now is 10A, Great Portland Street.
- F. W.**—Thanks for the interest you express. We do not, however, agree with you as to the necessity for answering the attacks. In the first place, the game is not worth the candle, and few people are deceived by persons notorious for mis-statement; in the next place, we have more important uses for our space, and having fully discussed the matter once, we are content to rest in the verdict of all whose opinion is worth consideration. You will find the matter fully answered on pages 380 and 402 of our last Volume. To your categorical questions we may reply that we never acknowledged that the collodio-chloride process was not ours, or claimed modifications. The statement that we did so is a simple falsehood. The process had no existence until we published it in 1864. M. Gaudin never claimed the process; but, in the course of some remarks on it soon after our first publication, said that, during his experiments with iodide and bromide of silver in collodion, he had with the chloride "experimented very little," and did not proceed because he was convinced "that there was no possibility of succeeding." 3. M. Gaudin's experiments with haloid salts of silver in collodion were published in 1861; we experimented in the same direction at a date anterior to the publication of M. Claudet's experiments; and we exhibited negatives produced without a nitrate bath at the North London Society. For fuller details see articles already referred to, if you are sufficiently interested in the question. For ourselves, we feel small concern in the matter. Nothing so thoroughly induces indifference to calumny as supreme contempt for the calumniator.
- W. J. A. G.**—We think it probable that you may apply without disadvantage a spirit varnish to a negative which has been varnished with amber varnish, but as we have not tried it we cannot speak with certainty. We should recommend trying the experiment on a worthless negative, and if all goes right you may then treat valuable negatives the same way with advantage.
- J. PALETHORPE.**—The material used in Marion's preservative cases is chloride of calcium. It may be obtained of most chemists.
- E. D.**—We have no doubt that the marks are the result of the action of hypo coming into contact in some way with the prints before fixing. The most probable cause which we can suggest is washing the prints in the same dishes before fixing in which some prints have been placed after fixing. We have known very similar-looking stains from such a cause. Some slight traces of hypo probably cling round the vessel in which the prints are washed before fixing, and probably before toning, and this will be sufficient to produce these slight irregular-shaped yellow stains.
- NOVICE.**—Your discoloured silver bath will not do any harm so long as it does not cause any permanent discoloured tint on the prints. The addition of a little of a solution of chloride of sodium (common salt) generally clears a bath well, causing a precipitate of chloride of silver, which carries down with it the particles of discoloured matter.
- H. S.**—So far as we can see, you have made the best of the means of lighting you possess, and, without the facility for obtaining more side-light, we do not see how improvement can be made. Send us a head of about an inch, lighted in the studio, and we can possibly offer some suggestion. We do not know of any capable person who could advise you professionally on such a matter.
- J. C. S.**—We shall be glad to receive a bottle of the collodion in question for examination. Thanks.
- T. H. REDIN.**—The prints duly received. Nothing can be better than their appearance. We hope to have time, soon, to make some experiments as to probable stability. Thanks.
- J. W. H. A.**—Albuminized paper excited and blackened by exposure, but unfixed, is an excellent thing for masks. Tinfoil has the disadvantage of frequently causing spots and stains. Thick orange paper also answers well.
- R. R. TAYLOR.**—For interiors, nothing could be better than the lens you inquire about; it will work much more rapidly than that you have been trying, and will give straighter lines. For groups, heads, &c., in the open air, it will answer well; but it is scarcely rapid enough for studio work. If you wish to combine fitness for studio work with suitability for interiors, the group lens of the same maker will answer better.
- L'OUVRIER.**—You cannot alter your lens to make it work quicker. If you work it with open aperture you get all the rapidity of which it is capable, unless it happen to be dirty, and require cleaning, which might, of course, make it a little more rapid. For what kind of object, and under what circumstances, do you give a thirty minutes' exposure? 2. *Sel Clement* is a preparation of nitrate of silver for printing, which is stated to be more economical than the ordinary nitrate.
- NATURAL.**—Several articles on double printing, for introducing natural backgrounds to portraits, have appeared in the *PHOTOGRAPHIC NEWS* this year; and a few weeks ago we published an article on the production of double negatives for the same purpose. There is no work devoted to double printing; but our *YEAR-BOOK* for 1864 contains a full article on the subject by Mr. H. P. Robinson.
- LYTLE'S STUDIO.**—If the reticulation in your collodion film is present before varnishing, it is due to the presence of too much water in the collodion—that is, the alcohol has not been sufficiently highly rectified; but if, as its appearance indicates, the cracking appears after varnishing, it is due to a slight tendency in the film to dissolve under the varnish, which may arise from the use of very strong alcohol in the varnish, or from the quality of the pyroxyline. A weak solution of gum poured over the negative before it is dried would prevent this. If you explain more fully we can more fully advise you. A negative packed in a box is not treated as a book parcel, and eightpence additional postage had to be paid at our office.
- A. X.**—The microscopic photographs to which you refer were produced by M. Dagron in Paris. We do not know of any English house which supplies them commercially, nor do we remember any detailed account of M. Dagron's mode of working. The kind of paper, proportion of salt and albumen, &c., all affect the colour of the print in the printing-frame. A highly albuminized *Rice* paper will, as a rule, print of the foxy colour you ask for.
- T.**—To rectify alcohol it should be distilled over carbonate of potash. Agitating with carbonate of potash and decanting would remove water, but there is a risk of a little water holding the potash salt in solution remaining. The iodized collodion remaining colourless might be due to such a cause, but it may also be due to the presence of methyl, which combines with free iodine and prevents the colouration of the collodion. The proportion and strength of the solvents are satisfactory. There is a patent method of purifying methylated spirit, but we believe its use has been declared illegal. The addition of alcoholic solution of iodine will produce a similar effect to that produced by the liberation of iodine; but at first the iodine added will probably be absorbed, and the collodion remain colourless. A collodion for copying prints should be made with a cotton giving intensity, should have plenty of the cotton, should be chiefly iodized with salts of potassium, and contain no more bromide than is necessary to clean working—less than half a grain per ounce. The object of using strong acids and adding water is to gain an increase of temperature by the mixture of water with the sulphuric acid.
- G. G. (Stockton).**—It is difficult to say why you should get fog in performing precisely the same operations which, in other hands, succeed well and yield good results, unless the condition of your chemicals is in some way imperfect. Let us know whose collodion you used, and condition of bath; also how long you left plate in the bath first time, and how long in the distilled water. The plate does not require long immersion in either before exposure. Was your distilled water pure?
- DR. LIESEGANG.**—The chloride of lithium received safe. Thanks. Several Correspondents in our next.

Photographs Registered.

Mr. F. DOWNER, Watford,
Three Photographs of Lord Rokeby.
Mr. C. SANDERSON, Preston,
Photograph of Rev. W. W. Mitchell.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 521.—August 28, 1868.

CONTENTS.

	PAGE
The British Association for the Advancement of Science.....	409
Visits to Noteworthy Studios	410
Pictorial Effect in Photography. By H. P. Robinson.....	412
Recent Experiments with Collodion. By Dr. Vogel.....	413
On Sulphocyanide of Ammonium. By Dr. T. L. Phipson, F.C.S., ..	414
On a Peculiar Action of Light upon the Salts of Silver. By Professor Morren.....	416

	PAGE
On Actinometry. By L. Bing	416
Photophonography. By T. Skaife	418
Correspondence—"Lux Graphicus" on the Wing—Decomposition in the Acetate Bath: Paralysis among Photographers ..	418
Talk in the Studio.....	419
To Correspondents	420

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE thirty-eighth meeting of the British Association for the Advancement of Science was commenced in Norwich on Wednesday, the 19th instant, under the presidency of Dr. Hooker, Director of the Royal Gardens at Kew. The presidential address, not so profound or so brilliant as those of some preceding years, was able, comprehensive, and practical. The most interesting part of the address related to recent researches among the indigenous populations of India. It would, he said, surprise many of his hearers to learn that within three hundred miles of the British capital of India there existed a tribe of semi-savages which habitually erected dolmens, menhirs, cists, and cromlechs, almost as gigantic in their proportions, and very similar in appearance and construction, to the so-called Druidical remains of Western Europe. In dealing with this subject he paid a passing tribute to the importance of photography in such investigations, and stated that the efforts of the Indian Government in obtaining photographs of the native Indian tribes had been eminently successful, the high value of the photographs rendering all the more disappointing some literary matter which had been published in connection with them. Some excellent remarks followed on the government and use of museums of natural history, in which Dr. Hooker enforced the importance of giving them a specifically educational character, by the suitable classification of the contents, and demonstrations to be given by the curator of each museum. Passing on to his own especial subject, botany, the speaker paid a high tribute to Darwin and his theory of the origin of species. The speaker concluded by some remarks on religion and science, pointing out that a positive, earnest, conscientious investigation was the proper attitude of man in relation to both questions. "Science," he said, "has never in this search hindered the religious aspirations of good and earnest men; nor have pulpit cautions, which are but ill-disguised deterrents, ever turned inquiring minds from the revelations of science." To search out his "whence and whither" must ever be an unquenchable instinct with man. "But," he added:—

"A sea of time spreads its waters between that period to which the earliest traditions of our ancestors point, and that far earlier period, when man first appeared upon the globe. For his track upon that sea man vainly questions his spiritual teachers. Along its hither shore, if not across it, science now offers to pilot him. Each fresh discovery concerning pre-historic man is as a pier built on some rock its tide has exposed, and from these piers arches will one day spring, that will carry him further and further across its depth. Science, it is true, may never sound the depths of that sea, may never buoy its shallows, or span its narrowest creeks, but she will still build on every tide-washed rock, nor will she deem her mission fulfilled till she has sounded its profoundest depths and reached its further shore, or proved the one to be unfathomable and the other unattainable, upon

evidence not yet revealed to mankind. And if in his track he bears in mind that it is a common object of religion and of science to seek to understand the infancy of his existence—that the laws of mind are not yet relegated to the domain of the teachers of physical science, and that the laws of matter are not within the religious teacher's province—these may then work together in harmony and with good will."

On Thursday the business of the Association commenced with the Report of the Kew Committee. It recorded, amongst other things, that a self-recording magnetograph for the photographic registration of magnetic changes had been supplied to the Colaba Observatory in Bombay, together with a complete equipment of photographic apparatus and material. The photographic department at Kew, under the charge of Mr. Page, was stated to work satisfactorily. The Kew photo-heliograph, in charge of Mr. De la Rue, continued to be worked in a satisfactory manner. During the past year 224 negatives had been taken on 140 days. Ninety pictures of the Pagoda in Kew Gardens had likewise been taken, in the hope of being able, by this means, to determine accurately the angular diameter of the sun.

In Section A, devoted to mathematical and physical science, Professor Tyndall presided, and opened the proceedings with an eloquent address, pointing out the purpose and especial advantages of the British Association. Quoting Fichte, in his "Vocation of the Scholar," to the effect that the culture of a student should not be one-sided, but all-sided, in order that his intellectual nature might expand spherically, and not in a single direction, he proceeded:—

Fichte's idea is, to some extent, illustrated by the constitution and the labours of the British Association. We have here a body of men engaged in the pursuit of natural knowledge, but variously engaged. While sympathising with each of its departments, and supplementing his culture by knowledge drawn from all of them, each student amongst us selects one subject for the exercise of his own original faculty—one line along which he can carry the light of his private intelligence a little way into the darkness by which all knowledge is surrounded. Thus the geologist faces the rocks; the biologist fronts the conditions and phenomena of life; the astronomer, stellar masses and motions; the mathematician, the properties of space and number; the chemist pursues his atoms; while the physical investigator has his own large field in optical, thermal, electrical, acoustical, and other phenomena. The British Association, then, faces nature on all sides, and pushes knowledge centrifugally outwards, while, through circumstance or natural bent, each of its working members takes up a certain line of research in which he aspires to be an original producer, being content in all other directions to accept instruction from his fellow-men. The sum of our labours constitutes what Fichte might call the *sphere* of natural knowledge. In the meetings of the Association it is found necessary to resolve this sphere into its component parts, which take concrete form under the respective letters of our Sections.

His concluding remarks are pregnant, and worth quoting:—

The process of things upon this earth has been one of amelioration. It is a long way from the *Iguanodon* and his contemporaries

to the President and Members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development or as the result of successive exhibitions of creative energy, neither view entitles us to assume that man's present faculties end the series—that the process of amelioration stops at him. A time may therefore come when this ultra-scientific region by which we are now enfolded may offer itself to terrestrial, if not to human investigation. Two-thirds of the rays emitted by the sun fail to arouse in the eye the sense of vision. The rays exist, but the visual organ requisite for their translation into light does not exist. And so from this region of darkness and mystery which surrounds us, rays may now be darting which require but the development of the proper intellectual organs to translate them into knowledge as far surpassing ours as ours does that of the wallowing reptiles which once held possession of this planet. Meanwhile the mystery is not without its uses. It certainly may be made a power in the human soul; but it is a power which has feeling, not knowledge, for its base. It may be, and will be, and we hope is, turned to account, both in steadying and strengthening the intellect, and in rescuing man from that littleness to which, in the struggle for existence, or for preëminence in the world, he is continually prone.

In the Chemical Section the first paper of interest to photographers was one by Dr. Plipson on Sulphocyanide of Ammonium, which, although more relating to its uses in agriculture than in photography, possesses sufficient interest for reprinting, and will be found on another page.

In the evening a soiree was held in St. Andrew's Hall, at which fewer objects of scientific interest than we have ever seen on a similar occasion were exhibited: a display of models of artillery, &c., and of photographs of cannon, and the effects of shot at Shoeburyness and elsewhere, all under the charge of Mr. Spiller, together with some fine photographs by Mr. Sawyer, formed the chief feature of the display.

On Friday, in the midst of sectional business, a telegram from India was read, to the effect that the observation of the solar eclipse had been mainly successful, although there had been some light clouds. Subsequently a telegram was received by the President of the Astronomical Society from Dr. Jaussen, of Paris, as follows:—"Eclipse observed. Protuberances' spectrum very remarkable and unexpected. Protuberances of a gaseous nature."

In the Section A, on Friday, Col. Strange read an important paper on the importance of Government aid in securing the progress of science, upon which we shall have something more to say hereafter. A paper on Actinometry, by Mr. L. Bing, was also read: it will be found on another page. A valuable report was presented by Mr. Catton on his Synthetical Researches on Organic Acids. In the evening Professor Fergusson lectured on Ancient Buddhist Remains, using as illustrations some enlarged drawings from photographs.

On Monday a paper was read by Professor Morren on a Peculiar Action of Light on Salts of Silver, pointing out that if moist chloride of silver be blackened by light in a sealed tube, and then placed in the dark, the chlorine still present will again attack the reduced silver, and reproduce chloride. We reprint the paper on another page.

In the limited space at our disposal we can only notice such part of the extensive proceedings of the Association as may be interesting to our readers as photographers. Although not directly bearing on their art, we may mention a curious contribution by Dr. Richardson, on the Transmission of Light through Animal Substances. He exhibited a magnesium lamp, made for him by Mr. Solomon, by which he was able to transmit light through the semi-transparent substance forming the bodies of living men. The structure the most diaphanous was the skin; after that, and singularly enough, bone; then thick membranes; next, thin superficial muscles, lung tissue, fat, and the dense tissues of the liver and the kidney. Various lights had been tried—viz., the electric, the oxy-hydrogen, the lime light, and the magnesium. For all practical purposes the magnesium light was the best; it was the most convenient to use, and the light had the advantage of penetrating deeply. In the lantern which Dr. Richardson exhibited the light was also unattended with heat at the

point of observation, so that the hand could be put in at the brightest illuminating point. The structure to be examined was placed in a groove provided enclosed between two discs of perforated wood, and the object was surveyed from the further end of the tube. A thick piece of bone, the flat rib of an ox, was placed in the lantern, and light was distinctly transmitted through it by way of illustration. Animals whose tissues were thin, such as fish, could be placed in the lantern, and the condition of their circulation and respiration could be carefully studied under the action of various agents. In the human subject, especially in the young, with fragile tissues, the thinner parts of the body could be distinctly rendered transparent; and in a child, the bones, with a somewhat subdued light, could be seen in the arm and wrist. A fracture in a bone could, in fact, be easily made out, or growth from bone in these parts. In a very thin, young subject the movements and outline of the heart could also be faintly seen in the chest, but the light he had as yet employed had not been sufficiently powerful to render this demonstration all he could desire. It would be possible, lastly, to see through some diseased structures, so as to ascertain whether, within a cavity, there was a fluid or a solid body.

On Monday, in the Department of Zoology and Botany of Section D, Dr. Karl Koch read a paper in which he called attention to the necessity of having photographs as aids to the systematic comparison of living plants, for after some were dried they gave a very imperfect idea of the physiognomy whilst growing. He was making such a collection of photographs of the plants in the Botanic Gardens at Berlin, and he invited possessors of gardens and green-houses to produce photographs of their contents, and so aid to form complete collections. In the same Section, and in some others, photographs were largely used to illustrate the papers of the contributors.

On Tuesday evening, Dr. Odling delivered an interesting lecture on "Reverse Chemical Action," and a second soiree was held in St. Andrew's Hall. A somewhat better collection of photographs was exhibited on the occasion. In addition to the fine photographs by Mr. Sawyer, there were some fine examples of the Eburneum process and other photographs by Mr. Burgess. Mr. Henderson, of London, sent down a frame of enamels by the process he has recently worked out with so much skill and energy, the details of which, however, are unknown. Many of the specimens were exceedingly perfect, and left little to desire. There were also some examples of Mr. Woodbury's process, and some examples of the value of clouds in photographic landscapes.

The Association was, as a whole, a less brilliant success than it has been on some occasions, the total number of members and associates present falling short of 2,000, whilst on recent occasions it has exceeded that number by some hundreds. There were fewer objects of interest at the soirees, and generally less enthusiasm than we have seen at many recent meetings. The photographic contributions were fewer and of less interest than on many occasions. One well-known face was missed in sections A and B, always associated with one or more photographic papers at these annual gatherings; we refer to M. Claudet. Mr. Joseph Ellis's memoir of him, reprinted as a pamphlet from the *Scientific Review*, was delivered amongst the members.

The next meeting will be held at Exeter, under the presidency of Professor Stokes.

VISITS TO NOTEWORTHY STUDIOS.

MR. BURGESS'S STUDIO AT NORWICH.

THE pilgrim visiting photographic shrines meets with an experience in England which is somewhat diverse from that he encounters in most other countries. In France, for instance, whilst he may occasionally meet in large provincial towns with fine examples of work, it is in Paris he will find the concentration of excellence: photographs of the

highest qualities in the greatest profusion, and in the greatest variety, spread broadcast over the city. Visitors are apt to regard Parisian photography as typical of French photography, a great mistake. In this, as in many other respects, Paris absorbs the refinement of France. The same fact, in relation to photography at least, is true of most parts of Continental Europe. In America the visitor's experience will not be far different. The highest excellence will be found concentrated in metropolitan towns, such as Boston, New York, Philadelphia, Baltimore, Chicago, &c., whilst in provincial towns will be found men whose chief business still consists of the collodion positive or "Ambrotype."

All this may seem very simple and very natural; probably it is so; but the noticeable fact is, that it is not so in England. Probably in no city in the world is there so much commonplace and relatively bad photography produced as in London. There are, of course, first-rate photographers in the metropolis, a few of unsurpassed excellence in their line, and a few more of high average excellence; but it is scarcely an exaggeration to say that the number of portraitists of really first-class ability, photographic and artistic, might be counted on the fingers of one hand. Foreigners for the first time visiting England notice this fact; provincial photographers visiting London are struck with it. But on travelling through the provinces the experience is reversed: the observant traveller is perpetually meeting in country towns with the works of some modest photographer possessing photographic excellence and art qualities far beyond the average. This is not unfrequently the case in some comparatively unknown provincial town; more frequently in a city of some fashionable or commercial importance. We might easily, if it would not be invidious, mention a score of illustrations of our position. The reader will, however, readily recall to mind the multitude of names distinguished in photography, whose reputation belongs to the provinces and not to the metropolis.

We are led to these reflections by a brief sojourn in the picturesque and ancient, but somewhat unprogressive, city of Norwich, where we visited two studios: that of Mr. Sawycr, and that of Mr. Burgess,* the latter a gentleman whose name is known to our readers as the inventor of the Eburneum process, and as the author of various ingenious and useful suggestions which have appeared in our pages. We propose to describe the studio of Mr. Burgess first.

As might have been anticipated, Eburneum pictures form the speciality of his establishment, a good collection of excellent examples being displayed in his specimen room. These admirably illustrate the value of the process. Here, from one negative, are half-a-dozen sizes of one portrait, showing the effect of various gradations of enlargement, from a card size to a whole-plate or ten by eight picture; and the fact we have before mentioned was very noteworthy here, that owing to the exquisite delicacy of the material, everything like coarseness, commonly characteristic of enlargements, was entirely absent, and, further, that in some of the enlargements an amount of detail and gradation was present altogether wanting or imperceptible in a paper print from the original negative. Amongst the specimens we find some illustrations of the fitness of Eburneum prints for colouring, the effect being scarcely distinguishable from that of an ivory miniature, the similarity to genuine ivory in tint and transparency, of the fictile material, being of especial value for colouring purposes.

Whilst we are examining the specimens we ask Mr. Burgess's opinion as to the question of stability as based upon the four years' experience he has had. There are two possible sources of change in the materials of the finished picture, in regard to which we are anxious to obtain the results of experience. The possible elements of change are, first, the presence of a trace of chloride of silver, formed

when touting a silver print by means of chloride of gold; and, second, the known tendency of gelatine to become darker in colour. Mr. Burgess answered our question by placing in our hands a most charming whole-plate Eburneum portrait of a child, which had been for upwards of a twelvemonth in his window exposed to a blaze of light, often to direct sunlight. The picture was faultless in colour: the lights were of a delicate warm-toned white, peculiarly satisfying and pleasant to the eye; the half-tints were warm and rosy, and the deep shadows a rich deep neutral black. He then informed us that on removing the picture from the mount, after the long exposure to light, he found that the blacks and half-tones were a little deeper in the exposed portions than in those under the mount. The minute traces of chloride of silver formed had doubtless been reduced; but this only served to give a slight increase of force to the picture. The lights containing no silver were unaltered; but the various gradations of black had become, in just an appreciable degree, more strongly marked. In some cases, after long exposure to light, the whites acquire a slight tone, approximating to a delicate cream tint; but Mr. Burgess has not in his experience met with any change which involves deterioration.

In answer to questions as to the stability of the gelatine itself, and its susceptibility to change from heat and moisture, Mr. Burgess stated that if prints were kept carelessly in a very moist place, and then changed to a very hot or dry place, they would certainly manifest a tendency to curl and cockle; but with the ordinary care due to a work of art, and which a water-colour drawing, say, would receive, he had never had any trouble in preserving the pictures in perfectly good condition.

Beside Eburneum pictures, we find in the reception room a variety of excellent examples of paper portraiture, and notably a fine collection of views of Norwich. A very charming twelve by ten view of the Cathedral, seen through a clear opening in foliage in the foreground, composing admirably, is pointed out to us as an excellent example of what may be done by using the front combination of the rectilinear lens as a single landscape lens, just the requisite amount of angle being secured, he stated, which he could not readily have obtained with any other lens in his possession. Another view of the Cathedral alone is an admirable photograph, and, by the printing-in of clouds from a second suitable negative, it becomes a charming picture.

We will now ascend to the studio, which possesses many capital properties, and furnishes an excellent example of making the best of existing facilities. It is not a glass-room built for the purpose, but is what may be termed a converted studio. At the top of the building, which was suitable for business, Mr. Burgess found a large room, 38 feet long by 17 feet wide, with a low ceiling less than 9 feet high. On removing a portion of the ceiling, the ridge of the outer roof is found to be very lofty. Accordingly, Mr. Burgess had a portion of the ceiling removed, commencing with 5 or 6 feet of one end of the room and extending laterally about 12 feet. Into the roof thus laid bare he had two large sky-lights placed, each sloping from the ridge about 15 feet high, to the eaves about 9 feet high, forming on each side a space of glass about 12 feet square, placed at an angle of about 45 degrees. These lights face north and south, the latter, except for occasional purposes, being covered by blinds. In the north side wall are two or three small windows, of about 3 feet square, which for certain effects are available in lighting, but for most purposes are ignored and often covered up. The light of the room, it will be seen, is derived, in fact, from a skylight; but is in effect, from the steep pitch of the roof and the great width of the room, a high side light. A large reflecting screen of tinfoil in the frame-work of a pier-glass is made available in various effects of lighting. It will be seen that the lighted portion of the studio forms a room about 17 feet square, with a couple of lofty skylights. Beyond is the portion of

* The name of the firm is Burgess and Grimwood, but we did not ascertain that Mr. Burgess's partner took any active part in the business.

the original room with its low roof, and no light beyond what might be admitted through a couple of very small windows on one side: the windows are kept covered, however, by blinds, this portion of the room providing the obscurity for the photographer and the camera which is sought by some in dark tunnels.

The studio is well supplied with good accessories: there is a variety of tables and chairs of good design; a rustic stile, rails, and some similar properties; a couple of shallow trays, about 7 feet long, 20 inches wide, and 3 inches deep, containing mould planted with natural foreground consisting of weeds, flowers, and ferns, amongst which we may mention, by-the-way, that the common nettle seemed most hardy. There is a variety of backgrounds, of which the favourite one appears to be one of a greenish-blue cloth, which, instead of being stretched on a frame or roller, is simply suspended by rings on a cord or wire stretched across the room, and kept stretched by two or three rings at the bottom attached to hooks on the floor. There is a capital contrivance for producing gradations of light and shadow on the background. It consists of a light-covered frame 7 or 8 feet long and 3 or 4 feet wide. This is suspended by a centre at each end of the frame, just above the background, and between it and the skylight. A cord attached to one side runs through loops along the ceiling, and hangs down beside the camera, within reach of the operator's hand. By pulling this cord the hanging screen can be placed in any position, and may be made, by reflection, to throw an extra portion of light on the background, or by intervening entirely, to cut off much of the light and produce tolerably deep shade.

That Mr. Burgess is an art student his work renders apparent, and we find on a table in his studio the quaint old quarto of Gerald de Lairese. In the surroundings, generally, an artistic feeling is manifest. In his mode of operating and dealing with his sitter the same quality is apparent—a fine taste, and quiet, unobtrusive demeanour, an absence of fidgetty uncertainty in making his arrangements, all conducing to a satisfactory result in portraiture.

We had the pleasure of watching the simple, certain, and rapid manipulations in producing fine prints by the Eburneum process, some further observations upon which, in relation to points of practice, we must defer for a future number.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXXI.

"The same principles of uniformity and variety or variegated unity which must be previously pursued in so arranging and constructing the figures and general forms of a picture that they may serve as a proper substratum for that chiaroscuro which brings them to the sight as an harmonious totality—these same principles, and these *only*, are the constituents of all similar agreeable effects."—BARRY.

CHIAROSCURO—PORTRAITURE—(continued).

SINCE the last chapter was in the hands of the printer I have had the pleasure of receiving a visit from M. Adam-Salomon, the great master of photographic chiaroscuro, whose name and works I have had occasion to mention frequently, and we enjoyed a day's work together in the studio. It was gratifying to me to find that the direction that I gave in Chap. XXX. for lighting a head very closely resembled the arrangements employed by this famous photographer. The secret of success depends not so much on any given formula for the adjustment of blinds and backgrounds as upon a proper appreciation of what treatment is required to give character and individuality to heads that differ so much from one another as those which come under the consideration of professional photographers; but it will be found in practice that the four white blinds described, and the use of the studio diagonally, will give a very wide range of effects.

It was an instruction from Queen Elizabeth to Zucchero, when he was about to paint her portrait, that he should put

no shadow into her face. A similar story is told by Catlin of some Red Indians whom he painted. The Queen of England—in that period which has been called the Augustan age, when Shakespeare, Ben Jonson, and Spencer wrote—and the noble savages were equally ignorant of art and its requirements. The portrait photographer of the present day will occasionally hear his sitter say, "One-half my face is not black." This is, no doubt, sometimes said, after the fashion of the virgin queen, through ignorance; but it will be more often found that the lighting of the head is in fault, that the light has been too violent, the exposure too short, or the intensification carried too far; and because of these causes the gradations in the shadows, as well as the lights, are lost, and there is no transparency in the shadows, or balance of light and shade.

The light that illuminates the head will, of course, be that which lights the figure; it therefore follows—the light being fixed—that the only other means of modifying the chiaroscuro of a portrait is by the colour of the dress of the sitter and accessories, and by the background. Of the light and shade of the background I have sufficiently treated in Chapter XXII.; the degree of importance given to the accessories will, in a great measure, both as regards lines and light and shade, establish the degree of consequence to be given to the head. In giving great prominence to the head, care must be taken that it be not wholly isolated. The accessories are the media which act less as a foil to the head than as aids which assist it to keep its place without impairing its force, as the middle tones find value and clearness only by power of the lights or the strength of the shades.

The accessories should be employed not only to repeat forms, but also to repeat lights. If the head were left a white space in the midst of a large mass of dark, the effect would be that of a *speck* instead of a *mass* of light. The light of the head should be several times echoed throughout the picture in fainter tones. There must be no exact equality in any of the repetitions, neither should there be many, for if the lights are few and unequal, the result will be breadth and repose; if many and scattered, there will be confusion. To keep the chief mass of light clear and pure should be the constant and earnest aim.

The outlines of the figure or of the accessories should not be everywhere visible. When this is the case the effect is thin, wiry, and flat, like carved work without the relief of sculpture. Portions of the objects represented should melt into the background and shadows, which method will be found to produce rich, soft, and mellow effects.

The dress should be of that character best suited for producing harmonious results. It has been the practice of photographers to set their faces against particular colours as unsuitable, such as white or light blue, and always to recommend black silk. It is time this erroneous notion was done away with, and photographers should learn that if they fail to find white—especially silk or muslin—not only a possible, but a quite delightful, colour to photograph, they have not learnt all that it is possible for them to know of their art. What can be more beautiful or picturesque—conducive not only to light and shade, but to texture—than a muslin "Garibaldi" or jacket, worn with a silk skirt of any shade, so that it is darker than white? What can be better for a vignette than the sketchy lightness that is produced by the white dresses and light blue ribbons sometimes worn by children? And yet white and blue are often tabooed!

It is a fault much too common that all subjects are treated alike; gentlemen, ladies, and children are tarred with the same brush, and that often a very black one indeed, when they should be separately studied and treated. Intense lights and darks in conjunction (for instance, a black velvet coat near the face), surrounded by middle tones into which the highest lights and deepest darks are carried, seems to be a system very suitable to the portraiture of men. Ladies and children should always, I think, be treated in a lighter style, with more refinement and delicacy.

And this brings me to a subject which, I think, should

not be forgotten in a work on photographic chiaroscuro—definition and diffusion of focus.

For the last few years some photographs by a lady—many of them failures from every point of view, but some of them very remarkable for their daring chiaroscuro, artistic arrangement, and, in some few instances, delightful expression—have been brought prominently before the public. These pictures, for the qualities I have mentioned, have received the most enthusiastic praise from artists and critics ignorant of the capabilities of the art, and who, because of this want of knowledge of photography, have attributed the excellences which they undoubtedly, as masses of light and shade, possess, to their defects. These defects are, so little definition that it is difficult to make out parts even in the lights; in the shadows it often happens that nothing exists but black paper; so little care whether the sitter moved or not during the enormous exposure which, I have been told, is given to these pictures, that prints are exhibited containing so many images that the most careless operator would have effaced the negative as soon as visible under the developer; and, apparently, so much contempt for what we may almost call the proprieties of photography, that impressions from negatives scratched and stained, and from which, in one or two cases, the film has been partly torn away, are exhibited as triumphs of art. The arguments of the admirers of these productions are, that the excellences exist because of the faults, and that if they were in focus, or more carefully executed, their merit would be less. This is not true, and if it were, I should certainly say, Let the merits go, *it is not the mission of photography to produce smudges*. I think the artist herself is beginning to feel this, for I have seen some later productions much more carefully worked out. If studies in light and shade only are required, let them be done in pigment or charcoal, with a mop, if necessary, but photography is pre-eminently the art of definition, and when an art departs from its function it is lost. I must not be understood to mean that I object to that almost invisible diffusion of focus produced by spherical aberration in a lens, or by unscrewing the back lens, as arranged in Dallmeyer's group combinations; this is a power of immense value to a photographer, especially in large pictures; for portraits larger than 10 by 8 the lens should always be unscrewed at least one turn; by this means all parts are brought into focus without visibly injuring the definition in the usual plane of focus.

Having stated sufficient to initiate the photographer into the mysteries of chiaroscuro, and to induce him, I hope, to a further study of art, I will conclude this portion of my subject with an extract from Sir Joshua Reynolds's notes on Fresnoy's "Art of Painting," in which he describes his method of study, and which may be followed with advantage by the student:—

"I shall here set down the result of the observations which I have made on the works of those artists who appear to have best understood the management of light and shade, and who may be considered as examples for imitation in this branch of the art.

"Titian, Paul Veronese, and Tintoret were among the first painters who reduced to a system what was before practised without any fixed principle, and consequently neglected occasionally. From the Venetian painters Rubens extracted his scheme of composition, which was soon understood and adopted by his countrymen, and extended even to the minor painters of familiar life in the Dutch school.

"When I was at Venice, the method I took to avail myself of their principles was this: when I observed an extraordinary effect of light and shade in any picture, I took a leaf of my pocket-book and darkened every part of it in the same gradation of light and shade as the picture, leaving the white paper untouched to represent the light, and this without any attention to the subject or to the drawing of the figures. A few trials of this kind will be sufficient to give the method of their conduct in the management of their lights. After a few experiments I found the paper blotted

nearly alike: their general practice appeared to be to allow not above a quarter of the picture for the light, including in this portion both the principal and secondary lights; another quarter to be as dark as possible; and the remaining half kept in mezzotint or half-shadow.

"Rubens appears to have admitted rather more light than a quarter, and Rembrandt much less, scarce an eighth; by this conduct Rembrandt's light is extremely brilliant, but it costs too much; the rest of the picture is sacrificed to this one object. That light will certainly appear the brightest which is surrounded with the greatest quantity of shade, supposing equal skill in the artist.

"By this means you may likewise remark the various forms and shapes of those lights, as well as the objects on which they are flung; whether a figure, or the sky, a white napkin, animals, or utensils, often introduced for this purpose only. It may be observed, likewise, what portion is strongly relieved, and how much is united with its ground; for it is necessary that some part (though a small one is sufficient) should be sharp and cutting against its ground, whether it be light on a dark, or dark on a light ground, in order to give firmness and distinctness to the work; if, on the other hand, it is relieved on every side, it will appear as if inlaid on its ground. Such a blotted paper, held at a distance from the eye, will strike the spectator as something excellent for the disposition of light and shadow, though it does not distinguish whether it is a history, a portrait, a landscape, dead game, or anything else; for the same principles extend to every branch of the art.

"Whether I have given an exact account, or made a just division, of the quantity of light admitted into the works of those painters, is of no very great consequence; let every person examine and judge for himself; it will be sufficient if I have suggested a mode of examining pictures this way, and one means, at least, of acquiring the principles on which they wrought."

RECENT EXPERIMENTS WITH COLLODION.

BY DR. VOGEL.*

COMMUNICATED FROM THE PHOTOGRAPHIC STUDIO OF THE ROYAL INDUSTRIAL COLLEGE AT BERLIN.

IN my earlier experiments with collodion I showed that the quantity of sensitizing salt contained in a collodion influences in general the sensitiveness of the latter: the more sensitive a collodion is, the more salt it contains. I am now about to consider what influence is exerted by the proportion of bromine salt contained in collodion.

A few years back I described the working of bromine salt in collodion, and gave an account of an experiment with two collodions, both containing the same amount of iodine salt, to one of which, however, a bromine salt had been added. The bromine collodion proved to be the more sensitive for dark objects, and the compound containing no bromine was better adapted to light ones, the first giving a soft picture of a plaster cast surrounded by black drapery, the latter a solarized representation of the white cast and an under-exposed image of the black drapery. The bromine salt was, therefore, proved to be the more sensitive to dark rays, and from this fact the conclusion has been deduced that an increase in the quantity of bromine salt secures an increase of sensitiveness in the collodion for dark rays. This belief is very general, and we often hear advice to the effect that in order to soften a hard collodion more bromine salt should be added.

I myself for some time participated in this belief, until, after several observations, scruples arose in my mind as to the correctness of the theory.

On one occasion I added to a collodion which gave too hard results a little bromine salt, when, to my astonishment, the negatives produced therewith became more hard. A similar result was obtained on comparing Meynier's

* Photographische Mittheilungen.

slightly bromized collodion with mine, containing a large quantity of the salt.

These circumstances induced me to undertake a thorough investigation of the influence exerted by different proportions of bromine salt contained in iodized collodion, and with this view I compounded five different descriptions of collodion. In preparing these samples I employed the multiple proportions of the chemist, so that equivalent mixtures of iodide of cadmium and bromide of cadmium were present in each of the different collodions. The preparation of collodions of this description is very simple. I dissolved 17 parts of bromide of cadmium on the one hand and 18 parts of iodide of cadmium on the other, each quantity in 270 parts of alcohol, and thus obtained two solutions in which the amount of salt in each volume bore the same proportion to one another as the atomic weights of the two compounds. If a collodion containing one equivalent of bromine and one of iodine is required, equal volumes of the two liquids are employed, and in this wise I prepared all my equivalent collodions hereafter mentioned. After mixing the iodizing solutions, three times their volume of normal collodion, containing two per cent. of gun-cotton, was added, and the whole allowed to stand and clarify. The whole of the collodion samples were at first colourless, but after a lapse of several weeks the strongly iodized specimens began to assume a yellowish tint. The collodions I prepared were as follows:—

No. 1.	3 eq. iod. cadmium	+ 1 eq. brom. cadmium			
" 2.	" "	" + 1	" "	" "	" "
" 3.	1 " "	" + 1	" "	" "	" "
" 4.	1 " "	" + 2	" "	" "	" "
" 5.	1 " "	" + 3	" "	" "	" "

After preservation for six months the collodions were experimented with. For this purpose a white bust surrounded by black drapery was employed as the object to be photographed, and a Dallmeyer's stereoscopic apparatus as the camera. Of each plate one half was exposed for fifteen and the other for thirty seconds; the plates were sensitized one immediately after the other in the same bath, and all brought together in the studio, where they were exposed.

These comparative experiments were afterwards repeated in reverse order, so as to detect any errors which might possibly arise during the unequal periods of delay occurring between the sensitizing and exposure of the plates. All the negatives were developed in exactly the same manner, the result being as follows:—

(A). Nos. 1 and 2.—Nos. 1 and 2 behaved in the same manner, both yielding a soft, opaque, and at the same time brilliant picture; No. 1 appeared a little more intense than No. 2.

(B). Nos. 2 and 3.—No. 2 gave, as before, a brilliant, opaque, and soft picture; while No. 3 showed less details in the darker parts, and appeared less opaque, and harder.

(C). Nos. 3 and 4.—No. 3 was richer in detail in the shadows than No. 4, but with this exception the results were analogous to No. 3 above.

In all cases the strongly iodized plates were cleaner than those containing more bromine.

(D). Nos. 4 and 5.—No. 4 was the same as in experiment C. No. 5 deviated totally from the others; it was fogged, but at the same time showed much more detail in the darker parts of the picture than No. 4, and was softer, although weaker in the lights.

A repetition of the experiments, sensitizing the plates in the reverse order, gave similar results.

From this it will be seen that the strongly iodized collodions, Nos. 1 and 2, yielded the most brilliant, most opaque, softest, and most harmonious pictures, and that the strongly bromized collodions, 3 and 4, worked less clean, and harder; also that the collodion containing most bromine, No. 5, yielded a very soft picture, which was, however, weaker, and not so intense in the lights as Nos. 1. and 2. An increase in the proportion of bromine has therefore

at first the effect of rendering the collodion harder, and it is only when the bromine is added to the extent of that in No. 5 that softness is again secured, together with fogging and weakness in the lights.

As the tendency of a negative to fog may always be avoided by the use of an acid bath, the last named collodion (No. 5) possesses undeniable advantages for taking certain brilliantly-lighted objects, as, for instance, sun-lit landscapes.

Of peculiar interest is the comparison between the strongly iodized collodion, No. 2, which may be regarded as the most practical of all, and the remarkable bromine collodion, No. 5, which possesses such peculiar sensitiveness. Plates were prepared with both collodions, and exposed under similar conditions: the bromine collodion, No. 5, yielded a fogged picture, while the iodine compound worked perfectly clean. The lights, as also the shadows, appeared quite as elaborate in the strongly bromized as in the strongly iodized collodion, but the latter gave a more intense picture. On employing an older and more acidified bath, the strongly bromized collodion yielded pictures free from fog.

As I am at present prevented from continuing the prosecution of these interesting experiments, I publish the results already obtained. The introduction of new sensitizing salts in the place of cadmium compounds, and a careful study of their action, as likewise the influence exerted by different strong developers, and the employment of other sensitizing agents in lieu of nitrate of silver, and the behaviour of the above iodizers in dry-plate photography, are all open questions of great practical importance, in the solution of which many experiments will have to be undertaken.

A duty of a scientific nature, which promises to be of some importance to photography, calls me into the far south, and compels me to relinquish, for the present, my cherished researches. The reader is on this account requested to excuse the fragmentary form in which the above results have been made known.

ON SULPHOCYANIDE OF AMMONIUM.

BY DR. T. L. PHIPSON, F.C.S., ETC.*

This is a salt which can be obtained in large quantities from the products of the distillation of coal. It accompanies the other compounds of ammonia in the ammoniacal liquor of gas works. In several manufactories it is made to yield its ammonia for the production of sulphate of ammonia; for this purpose it is distilled with lime after the carbonate and sulphide of ammonium have been separated.

For many years I have noticed that the sulphate of ammonia supplied to commerce for agricultural and other purposes often contains a small quantity of sulphocyanide—say from 2 to 4 per cent.—but latterly a much larger quantity, which increases its yield in nitrogen when submitted to analysis, without bestowing upon the product a corresponding value in an agricultural sense. For though the nitrogen of the ammonium in the sulphocyanide can be utilized like that in sulphate of ammonia, that contained in the form of sulphocyanide escapes. In other terms, only one-half of the nitrogen in sulphocyanide of ammonium is available in the manufacture of artificial manures, since the other half is partly volatilized as sulphocyanhydric acid, and partly decomposed by the heat of the reaction, which is sometimes great enough to ignite the bisulphide of carbon resulting from the decomposition.

Within the last twelve months the quantity of sulphocyanide of ammonium present in some kinds of commercial sulphate of ammonia appears to have increased considerably, and several samples which I have examined recently have yielded upwards of 75 per cent. of this salt. In fact they were not sulphate of ammonia at all, but impure sulphocyanide of ammonium.

* Read in Section B at the British Association.

I found it necessary some time ago to discover a means of estimating rapidly, and with economy, the amount of this product when mixed with sulphate and chloride of ammonium and the various organic matters which usually accompany the commercial product.

Sulphocyanide of ammonium can be separated with tolerable accuracy from the sulphate by means of alcohol, in which it is freely soluble; but this method will not apply when chloride of ammonium is present also, nor does it give the sulphocyanide in a commercial form for weighing.

A method which I have satisfied myself gives very accurate results, and is sufficiently rapid, consists in dissolving a given weight of the product in water, filtering, rendering the solution rather acid, and precipitating the sulphocyanogen as an insoluble salt of copper by the addition of equal equivalents of sulphate of protoxide of iron and sulphate of copper. The whole of the sulphocyanogen is eliminated in this manner. The copper compound is received upon a tared filter, washed, dried at 100° C., and weighed. It is anhydrous, and contains $\text{Cu}_2, \text{C}_2 \text{N}_2 \text{S}_2$.

Having prepared a certain quantity of pure sulphocyanide of ammonium, I took the opportunity of studying some of its properties. Of these experiments I will mention only those which appear not to have been made before.

Sulphocyanide of ammonium dissolves copiously in water and in alcohol, and these solutions offer considerable interest. In the first place, in dissolving rapidly in water this salt produces a greater degree of cold than any other compound with which I am acquainted. About half a litre of water being poured upon 500 grammes of the impure salt, I was surprised, in stirring the whole together, to find that hoar frost appeared immediately on the external surface of the vessel. The temperature of the solution was found to be between 2 and 3 degrees below zero, that of the hot water used 96°, showing that the temperature had sunk 98° or 99° Centigrade in the space of a few seconds.

A substance which absorbs so much heat whilst dissolving would be expected to give out again much caloric when it crystallizes; and such is the case. With saturated solutions the crystallization is accompanied, on this account, with some curious phenomena: as one large crystal forms, the adjacent crystals are dissolved again by the heat produced, giving rise to a series of rapid movements in the liquid and along its surface. Some of these vibrations spread along the entire surface with the rapidity of lightning, and continue at short intervals until the whole liquid suddenly solidifies.

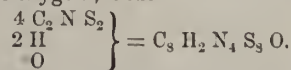
From concentrated solutions sulphocyanide of ammonium crystallizes in large transparent plates of a slightly pearly aspect; these plates appear to be formed of long prismatic needles intimately united, and are best obtained in very concentrated solutions; when weaker solutions are caused to crystallize, right rectangular prisms are formed; they are often of great length; I have occasionally obtained them two to three inches long.

The alcoholic solution of sulphocyanide of ammonium presents in the highest degree the peculiar phenomenon of supersaturation. A saturated hot solution, after cooling, will remain liquid for hours, probably for days together; but if the liquid is stirred with a glass rod it is immediately transformed into a mass of small crystalline plates. When, instead of a glass rod, a minute crystal of the salt itself is thrown into the supersaturated solution after it has become quite cold, at the same instant magnificent rectangular plates, having the four faces of the octahedron, begin to form rapidly upon the surface, and the vessel is soon filled with splendid crystals. The supernatant liquid, separated from these, can be made to deposit still a considerable quantity of small crystalline plates, by being stirred rapidly for a minute or two with a glass rod.

A concentrated aqueous solution of sulphocyanide of ammonium has no action upon sulphur, but it dissolves a considerable quantity of iodine, and when the dark-coloured solution is diluted and heated, the yellow compound called "sulphocyanogen" is precipitated, and the liquid becomes

colourless. Bromine acts in a similar manner. Each drop of bromine on falling into the warm solution produces a hissing noise; on boiling the liquid the sulphocyanogen compound is precipitated. These two precipitates are insoluble in alcohol, and soluble in sulphuric acid, like that which is produced by chlorides. The action of chlorine gas upon solutions of sulphocyanide of ammonium is very remarkable. If the solution is dilute, the sulphur is gradually oxidized to sulphuric acid, and no precipitate is formed. If concentrated, a dense precipitate of sulphocyanogen occurs after a little time. It is difficult to obtain the whole of the cyanogen in this form even when the liquid is kept near its boiling point the whole time. When the decomposition is complete, and the liquid separated from the precipitate is evaporated, it yields chloride of ammonium. The action of chlorine on this solution is yet incompletely known. The composition of the so-called "sulphocyanogen" has been much discussed; for some time this precipitate was considered to be the radical of sulphocyanhydric acid, but it was afterwards found to contain hydrogen and oxygen.

The composition assigned to this substance by Laurent and Gerhardt—namely, 3 eq. of cyanogen, 1 of hydrogen, and 6 of sulphur—appear to be inadmissible. The results of my analyses of this compound correspond with those of Voelkel, not with those of Laurent and Gerhardt. It should be stated, however, that Charles Gerhardt, to whom organic chemistry owes so many splendid investigations, whilst criticising Herr Voelkel's labours on sulphocyanogen, based his own opinion in this case upon an incomplete analysis of the substance in question. The product can be completely purified by washing with hot water and with alcohol should it contain any persulphocyanhydric acid, which seldom occurs, or, where it does happen to be present, is generally in too small a quantity to affect the results of the analysis. The dried precipitate is anhydrous. It has yielded me numbers which agree with the formula: $\text{C}_3 \text{H}_2 \text{N}_4 \text{S}_3 \text{O}$, as admitted by Herr Voelkel, and not with that of Gerhardt, which requires 24 per cent. of nitrogen (instead of 23.14) and nearly 55 per cent. of sulphur (instead of 52.41); it contains, then, the elements of 4 eq. of sulphocyanogen, 2 of hydrogen, and 1 of oxygen; thus—



The insoluble copper salt above mentioned was suspended in boiling water whilst a current of chlorine gas was passed through the solution, with the expectation of obtaining sulphocyanogen itself, but little or no decomposition ensued. When iodine was substituted for chlorine, the copper compound was partially decomposed, with production of some iodide of copper and an odour of iodide of cyanogen.

In conclusion, I may add, that as the products derived from sulphocyanide of ammonium are very numerous, it is not improbable that some of them may eventually be applied to some useful purpose; if so, it will be satisfactory to know that we possess a supply of this salt as inexhaustible as that of coal itself.

Dr. Frankland (President of the Section), in proposing a vote of thanks to Dr. Plimpson, remarked that the increased degree of impurity of commercial samples of sulphate of ammonia, at the same time that it prejudiced the interests of the agriculturists, offered a promise of the sulphocyanide of ammonium being supplied at a reduced cost for chemical purposes, and, there were no doubt, many uses to which this salt and other sulphocyanides could yet be applied.

Mr. J. Spiller instanced the employment of sulphocyanide of ammonium as a fixing agent in photography as one of the cases where a reduced cost would permit of its extended application. For this purpose the salt would need to be very carefully purified from alkaline sulphides, since these were liable to impart a yellow tinge to the high lights in the photograph. The sulphocyanide of ammonium stood much in the same condition as the hyposulphite of ammonia, which required further development on the part of manufacturers.

ON A PECULIAR ACTION OF LIGHT UPON THE SALTS OF SILVER.

BY PROFESSOR MORREN.*

THE molecular movements produced under the action of light present special interest, and in order to show my sympathy with this Association I present the results of some experiments, although they are at present not completed. The facts are these:—If in a tube of white glass from 14 to 15 inches long, and from 1 to 2 inches in diameter, you enclose moist chloride of silver freshly precipitated by means of a solution of chlorine in water, and expose it to the direct action of the solar rays, it will be observed that while the chlorine solution is still yellow the chloride of silver remains perfectly white; but afterwards the chlorine solution becomes colourless and clear, and the chlorine decomposes the water under the action of light. As soon as the chloride of silver blackens at the surface it should be agitated from time to time, and left exposed for a few days to direct light until the whole becomes of a fine black colour.

Now take the tube into a dark place, and you will see the blackness disappear by degrees, chloride of silver becomes reformed, and the contents of the tube become perfectly white, although its structure is evidently different to what it was previous to its exposure to light. Then we may expose it afresh to the sun, and after it has again become black we can make it white again, and this experiment can be repeated indefinitely, and is an evidence that in those successive reactions the chlorine, oxygen, hydrogen, &c., preserve their properties of combination and recombination. These gases manifest the properties which we, in France, call the nascent condition—properties certainly electric, and which only in certain circumstances become evident, but which, without doubt, exist in all bodies when the circumstances are favourable. We have plenty of examples in connection with oxygen, hydrogen, and similar bodies. There is one special and striking example in the experiment which ought to be mentioned. If we place chloride of silver in a thin and fine tube, one millimetric internal diameter, and close it at one end, this little tube being placed in the larger one, its chloride becomes dark under the action of light, but once dark it remains always black, whilst its neighbour, under the alternate action of light and darkness, blackens and bleaches, a manifest evidence of the molecular movements induced by the light upon the chloride of silver when surrounded by a suitable liquid.

It is easy to comprehend the value of the knowledge of this property in photography. We see with what care we ought to get rid of our enemy, hydrochloric acid, from our sensitive papers; to dry them perfectly, and to deprive them of all hygroscopic salts, for without doubt the image, especially the darker portions, will be liable to the decomposition and recombination above described.

Bromide of silver presents the same properties and the same effects; but it is necessary, in order for the bromide salt to become colourless, that a longer exposure should be given. With respect to the iodide of silver, there are special conditions requisite, and I have only been able to cause this salt to blacken in the sun after having sensitized it by means of pyrogallie acid. It does not blacken visibly without a reducing agent. It would be especially interesting to know if the cyanide of silver would behave in a similar manner in the presence of cyanogen; but I have not had time to make this experiment, but I hope to be able to record it at another meeting of the Association.

ON ACTINOMETRY.

BY L. HING.†

HAVING made a few experiments for the purpose of ascertaining the actinic power of light, which I considered might not be uninteresting to science, I beg to submit the following communication to your notice:—

Permit me, in the first instance, to speak briefly of an instrument of my construction for actinometric purposes, which is already known. It consists of layers of mica, and upon each number of layers of mica is placed a figure corresponding with such number by means of an opaque pigment. This instrument, being charged with sensitive paper and exposed to the action of light, yields a graduated series of tints upon such paper, presenting white figures surrounded by darkened surfaces. The highest visible figure is always surrounded by the palest tint.

This instrument has, however, several defects, the chief of which is, that according to the varying intensities of light its action will vary, as will be explained by the following experiment:—

You might come to the conclusion that, if the intensity of light transmitted through one layer of mica be equal to one, the intensity transmitted through two layers equal one-fourth, through three layers equal one-ninth, &c.; or that the intensities transmitted vary inversely as the squares of the numbers of layers of mica. It does, however, by no means appear that actinism is transmitted through a medium in the same harmonic progression.

From a rather thin negative print a positive, firstly in the direct rays of the sun, exposing at the same time a mica actinometer charged with sensitive standard paper also to the direct rays of the sun. Examine the positive picture from time to time in a so-called photographic dark room, or in any room lighted artificially by a non-actinic light, but remove also, or screen from the light, the actinometer during the time of the examination of the positive. When you consider the positive so far printed as to be fit for photographic toning, remove the papers both from the negative and from the actinometer, and write with a pencil upon the back of the one taken from the latter the word "sun."

Next print a positive from the same negative in diffused light in the open air, exposing at the same time the actinometer, charged anew, to the same light. Pursue the same course as before, and examine your positive from time to time in the dark room, having the first positive at hand for comparison with the second. It is best to fix upon some dark, yet not black, tint in your first picture for comparison with the second; also to hold the first picture by the side of the half of the second picture which you are examining in your printing-frame. Thus make frequent comparisons with the tint you have fixed upon until the two tints appear to be alike in depth of printing. Then remove again the papers from the negative and from the actinometer, and upon the one taken from the latter write the word "shade."

Print now a third positive from the same negative inside a window where daylight is but feebly diffused, exposing again simultaneously the newly-charged actinometer by the side of the negative. Pursue again the same plan as before. After this third positive has been found to be printed equally deep as the two former, place the three papers which have been printed under the actinometer side by side for examination in your dark room.

The paper which has been printed in the direct rays of the sun will present the largest number of figures; next comes that which has been printed by diffused light in the open air; and the least number of figures will appear upon the paper printed inside the window, although the three pictures might be pronounced alike.

The positives would, however, appear not to be quite equal in tone on a more exact examination of the extreme tints in each picture with one another. Their inequality would consist in this:—The positive printed in the feeblest light presents the deepest tint in the darkest shades, and the palest tints in the lightest parts; next comes the positive which has been printed in the more bright diffused light; and the positive printed in the direct rays of the sun exhibits the least contrast between its palest and darkest tints; and its darkest tints, compared with the darkest tints in the other two positives, presents the least depth, just as its palest tint, compared with the palest tints in the other two positives, is decidedly the darkest of the three. Indeed, it does not seem possible to print three positives in three lights of strongly-varying intensities to be exactly alike in all their tints.

If you examine now the tints, instead of the figures, in the three papers printed under the actinometer, they agree with the results presented in the pictures. The first tint of the paper printed in the feeblest light, which paper shows the

* Read at the British Association, in Section A.

† Read in Section A at the Meeting of the British Association.

smallest number of figures, is the darkest; next in order comes that which was exposed to the next brightest light; and the first tint of the paper that was exposed to the direct rays of the sun, and which exhibits the largest number of figures, is the palest on comparison with the first tints of the other two papers.

I once constructed an actinometer of only seven figures by means of a rather opaque medium. In the direct rays of the sun the printing of a positive from a certain negative required No. 5; in a diffused light in the open air, whilst the sun was shining, a positive from the same negative required only No. 3; and printing one dull winter's day from the same negative, and under the same actinometer, the positive was finished, and not the faintest trace of a figure presented itself upon the paper taken from the actinometer. The margins of the paper, projecting beyond the actinometer, had arrived at the stage of strong bronzing.

This instrument would thus appear to possess but small value, both for the scientific measurement of the actinic power of light, as well as for photographic purposes. It almost seems as if it had no other value but that of verifying, a fact with which most photographers are familiar, namely, that in order to produce good positives from thin negatives they ought to be printed in feebly-diffused light, because the feebler light will readily act through the more transparent parts of the negative, and but very slowly through the semi-opaque parts, thus yielding good contrasts between the tints of the picture; and, in accordance with this fact, the feebler light acts readily through the first few layers of mica, until, after passing through a certain number of layers, it seems to possess but very slow power to affect the sensitive paper.

I hope, however, to show presently some important uses to which this instrument can be applied, and would now beg to describe another instrument of my construction.

This instrument consists of a single tube, open at one end, where light for measurement is admitted, and closed at the other. This tube is constructed of three strips of yellow non-actinic glass, and the fourth side of the tube, where sensitive paper is applied, may either consist of a strip of pure glass, with a scale marked thereon, or of a narrow scale made of metal or any other material, in which case light affects the sensitive paper quite freely.

In this state the instrument can only be used for the measurement of the actinic power of diffused light. By applying, however, a small convex mirror or a small lens at the aperture of the instrument, the direct rays of the sun can also be measured on being received in a divergent direction within the tube. The action of light upon sensitive paper is here seen through the yellow non-actinic glass, and it can be watched without removal of the instrument or of the sensitive paper therefrom. The action of light can also at any moment be stopped, without removal of the instrument, by shutting the aperture with an opaque shutter, and thus excluding actinic light.

The principles upon which this instrument are founded are—

1st. That diffused light, on entering a tube at one end only, varies in intensity within the tube inversely as the square of the distances from the aperture where light enters.

2nd. That any number of tubes, whatever their magnitude, contain the same intensity of light if the ratios of their diameters to their lengths are equal, and if we absorb the light that may be reflected from their sides.

I would now beg to call your attention to the following experiments:—

Construct a series of tubes of cardboard, open at one end, and provided with a cover at the other, of the same diameter (say of two inches) and varying in length by a semi-diameter. Let the first tube be of two inches length, the second = three inches, the third = four inches, up to ten inches, or more, if you like; but these nine tubes will suffice. The inside of the tubes must be blackened, in order to absorb the light that would otherwise be reflected from their sides.

Next construct a number of small mica-actinometers of twenty or thirty figures, and of such dimensions that they can be placed within those tubes. For the sake of convenience, let each actinometer have a letter of the alphabet, whereby to name it, placed upon its first layer of mica instead of figure 1. Charge each instrument with a strip of sensitive standard paper, and insert one at the base within each tube, and secure each base against the entrance of light from without. Let the actinometer named A be situated at the base of the shortest

tube of two inches, B in that of three inches, C in that of four inches, &c., each succeeding letter in the next longer tube.

Expose now all the tubes which are open at the ends opposite their bases simultaneously to the same diffused daylight five, ten, or fifteen minutes, more or less; then take all the tubes at the same time into your dark room. Withdraw the actinometers from the tubes, and the papers from the actinometer.

Please to remember now that each letter of the alphabet will be surrounded by the darkest tint upon the paper removed from the actinometer which such letter represents, because such letter is placed upon the first layer of mica, and let now each paper also be named by such letter.

On comparing the papers with one another, the following results will appear:—

1. Compare with paper A, which was printed within the shortest tube, all the other papers.

The tint around letter B = the tint around No. 3 of paper A.

" " " C = " " " 5 "

" " " D = " " " 7 "

Thus, through the whole series the tint around each succeeding letter printed within the corresponding longer tube being paler by two tints.

2. Take any paper of the series (say paper D), and compare the following papers with it:—

The tint around letter E = the tint around No. 3 of paper D.

" " " F = " " " 5 "

" " " G = " " " 7 "

&c., as before.

3. Compare the papers successively with one another:—

The tint around letter B = the tint around No. 3 of paper A.

" " " C = " " " 3 " B.

" " " D = " " " 3 " C.

each first tint equalling the third tint of the paper printed in the next preceding shorter tube.

4. Compare all the figures which each paper presents with one another. Let, for instance, paper A show twenty-five figures.

	Paper A shows	25 figures,
Then	" B "	23 "
	" C "	21 "
	" D "	19 "

each succeeding paper printed within the next succeeding longer tube exhibiting two figures less than the preceding one.

The defect which has, in a former part of this memoir, been shown to exist in the transmission of the actinic power of light through a medium ought to become apparent in the above experiment. On account of the comparative shortness of exposure given, it can only be traced to a small extent in the fourth comparison of the papers. This does not, however, affect the general character of the experiment.

We may now draw from the above experiment the general conclusion that there is a decrease of two figures and of two tints in each succeeding paper, beginning with that which was printed within the shortest tube; or, if the paper printed within the longest tube be represented by 1, the paper taken from the next shortest tube would equal 3, and, thus continuing, we shall have the numbers 1, 3, 5, 7, &c. On adding these figures from the beginning, we produce the following series:—4, 9, 16, 25, &c., equalling the squares of the lengths of the tubes.

Without further analysis of the above experiment, I think it may be stated now that the power of actinism, as well as the intensity of light, within a tube, varies inversely as the squares of the distances.

Construct, next, two tubes, blackened within, of different diameters, and let the length of each tube be equal to (say) twice its diameter. Let one tube have a diameter (say) of two inches, and the other of six inches; then their respective lengths must be equal to four inches and twelve inches. Place at the base within each tube a mica actinometer charged with sensitive standard paper. Close each base, and expose both tubes simultaneously to the same diffused light for the same period of time. On examining the printed papers no difference whatever is exhibited in their appearance, either with regard to tint or to number of figures. You might make several such experiments, with any number of tubes of various diameters, and with the same results.

Thus the intensity of light as well as the power of actinism is the same in tubes of various magnitudes, if the ratios of their diameters to their lengths are equal.

It will be readily seen that instruments might be constructed by means of tubes of various lengths but of equal diameters, or

by means of tubes varying in diameter and of equal length, in order to produce gradations of light for actinometric purposes.

On account of its greater convenience, I have, however, chosen the single square tube, and of such tube one side, as already stated.

The power of actinism and the intensity of light at any given distance *on this side* of the tube are, however, by no means equal to the power of actinism and the intensity of light at such given distance *within* the tube. But the investigation of the powers of this side-light would be too lengthy for this paper.

I beg, finally, to state that, for scientific purposes, I use a tube one inch in width and four inches in length: for photographic purposes, such as the timing of photographic prints, a tube of half an inch in width by four inches in length.

The instrument is self-registering, and, by means of a continuous strip of paper and a simple clockwork, can be made to register the actinic power of light throughout the day, per minute or per hour, or any other chosen division of time.

By combining several instruments with one clockwork, the powers of actinism during each successive minute, successive hours, and during the whole day, could be registered separately.

PHOTOPHONOGRAPHY.

BY T. SKAIFE.

A PAPER and some photographs were sent by Mr. Skaife for the inspection of the members of Section A, but were not, for some reason not stated, brought before the section. These were three prints, described as "photophonograms." Nos. 1 and 2 consisted of photographs of a cup of tea, the surface of the liquid being agitated in harmony with the tones yielded by the photophone when emitting the note B flat. The third was described as "a photophonogram representing an octave of the musical gamut, obtained by rubbing the tip of the thumb on a piece of glass chemically prepared to give out any note in the gamut on the surface being rubbed with either finger or thumb, which leaves impressions on the surface corresponding to the notes' vibrations sufficiently dense to print from photographically."

In further explanation, he said these waves were produced by the tip of the thumb coming into frictional contact with the glassy surface of the photophone on which the cup of tea rested, all the nine waves appearing simultaneously and coincidently with the emission of the tone, and remaining, as it were, rigidly fixed, so long as the same tone continued to be emitted. The slightest depression or elevation of tone was instantly betrayed by a corresponding enlargement or contraction of the intervals which separated the waves.

The photophone, on the glassy surface of which the exciting tone was produced, was a wooden box 2 feet long by 1½ foot broad and 9 inches deep, especially constructed to propagate the vibrations of a thin glass plate covering the upper surface when excited by the frictional rubbings of the tips of the fingers moistened with certain chemical solutions, such as protosulphate of iron combined with acetic acid, tincture of horehound, watery collodion, or a saturated solution of bichromate of potash, the sounds emitted by the instrument resembling more or less those produced by the violin or violoncello. The photophone, in common with the violin, possesses the faculty of exciting into sympathetic action any fluid within the current of its vibration, the action of the fluid indicating optically the tone emitted acoustically.

The paper then proceeded to describe the mode employed in producing the negatives by means of the instantaneous combustion of 6 grains of "actinic powder," consisting of a mixture of powdered magnesium, chlorate of potash, and other ingredients.

He concluded with an apology for any imperfection in the illustrations by stating that only one week had elapsed since the cup of tea had betrayed its taste for the photophone's music. Nevertheless, he had thought that, time not allowing for further experiment, it might interest those experienced in the phenomena of light and sound to see results which photographically confirmed the ingenious discoveries previously made in optical acoustics by Helmholtz, Koenig, and Tyndall.

Correspondence.

"LUX GRAPHICUS" ON THE WING.

THE EXHIBITION OF NATIONAL PORTRAITS--THE TINTYPE OF AMERICA--THE SPIRIT OF PHOTOGRAPHY IN CANADA--THE "WISE WEEK," AND THE TOTAL ECLIPSE OF THE SUN.

DEAR MR. EDITOR,—From various causes I have been absent from your columns as a contributor for some time, but not as a reader. The chief reason for this was the weather, which of late has been so hot and prostrating as to dry up both my ink and my energies. Now that the atmosphere is more cool, moist, and pleasant, my ink and my thoughts may flow together, and the resulting epistle may find a place on some page of the PHOTOGRAPHIC NEWS; if not, I shall not be angry. I know that the world—and photography is my world—is not always mindful of its atoms. The great and immortal Cicero discovered that even he could be absent from Rome, and all Rome not know it. How much easier, then, for your readers not to discover my absence from your pages. But my inability to write and attend to other duties entailed more serious losses to myself. Amongst others I missed seeing the Royal Academy Exhibition, but found a compensating pleasure in going to see the Exhibition of National Portraits at South Kensington. What a school it is for photographers! What a variety of pose, arrangement, management of light and shade, is to be seen in that glorious collection of Vandykes, Hogarths, Gainsboroughs, Reynolds, Opies, Wilkies, Raeburns, Northcotes, Lawrences, Phillips, Shees, Richmonds, Grants, and many others of the present day! I hope many photographers have seen the collection. None ought to have missed the opportunity. All that saw must have profited by the sight. Portraits of great men that have been familiar to me in black and white for years were there before me in the rich mellow colouring of Vandyke, Reynolds, Wilkie, and Lawrence, and the mind seemed carried back into the past while looking at the works of those great artists.

The exhibition will soon close, and all that have not seen it should endeavour to do so at once. There may never again be seen such a gathering together of the great of England, painted by England's greatest portrait painters. The Manchester Art Treasures Exhibition was a great assemblage of the glory of England, but it was not so complete, nor so instructive, nor so comfortable to view as that now open at South Kensington. In addition to the paintings there is a large and valuable collection of rare engravings, both in mezzotints and in line. The latter collection alone would make a visit highly pleasing and, in a sense, remunerative to every photographer. Art is beginning to take root in the minds of those who follow photography, either professionally or for amusement, and those exhibitions are the salt that "savoureth the earth," which in due time will bring forth rich fruits.

The "Tintype" is now being largely practised in America, and is fitted into an envelope or slip, carte-de-visite size. The slip is formed of paper, with an aperture to show the picture, and a flap to fall over it as a protector. I had some of these shown to me a short time ago. The tintype is only another name for the ferrotype or melainotype, which is a collodion positive picture taken on a piece of tin or iron, coated with black japan on the front, and a varnish on the back, to prevent the metal from acting on the bath. The carte-de-visite form of the tintype fitted in the envelope or holder is a very good and ready way of supplying all portraits wanted in a hurry, and its adoption might be found very serviceable to many photographers in England. The American examples that I have seen are very brilliant and beautiful, and, to my mind, next in delicacy of detail and richness of colour to the long discarded but ever beautiful Daguerreotype. I must admit, *en passant*, that the Americans always excelled in producing fine, brilliant Daguerreotypes, and it is much the same with them in the production of glass positives, ferrotypes, or tintypes.

The spirit of photography in America and Canada is admirable. Mr. Notman, of Montreal, has long been doing some excellent cabinet pictures representing out-of-door life, pleasures, and pastimes. Now Mr. Inglis, of Montreal, also produces most beautiful *carte-de-visite* and cabinet pictures of indoor and out-of-door scenes, such as drawing-rooms, libraries, &c., with suitably arranged and occupied figures in the former, and boating, bathing, and fishing parties in the latter. Some of these pictures have recently been shown to me. They are all very fine examples of photography. The tone and quality of some are beautiful. Many of them are admirably arranged, and exhibit considerable knowledge of composition; but some of them, particularly the interiors, are sadly at fault in their chiaroscuro. They possess no dominant light, or, if they do, it's in the wrong place, leading the eye away from the principal object. In most cases the lights are too scattered, giving a spotty and flickering effect to the picture which is painful to look at. With his out-of-door scenes Mr. Inglis is more happy, and probably, from his antecedents, more at home. For example, the "Boating Party" is very happily composed, embracing the double form of angular composition—the triangle and the lozenge—and just a little more skill or care would have made it perfect in its lines. The whole scene is well lighted and got up. The boat, foreground of pebbles, stones, shrubs, and trees are all real; the water is represented by tin-foil, wet black oil-cloth, or something of the kind, which reflects the forms and colours of objects placed upon or above it. The reflections seem too sharp to be those of water. The plan adopted by Mr. Ross, of Edinburgh, is the best. That gentleman has a large shallow trough fitted up in his studio with water in it.

Surely such pictures of groups of friends and families would take in London and the provinces if people only knew where to get them. At present I know there is not a place in London where photographic pictures possessing such a variety and interest can be obtained. Mr. Faulkner, of Kingston Gardens Square, is the only photographer that has yet attempted to produce such rural subjects in London, but I am not aware that he has yet introduced "the boat" into his studio.

This is the "Wise Week," and it is to be hoped that the gathering together of the wisdom of the world at Norwich will in some way be beneficial to photography. You, Mr. Editor, I presume, will attend the meetings, and I shall look forward with considerable interest to your gleanings from the harvest of science that will this year be garnered in the transactions of the British Association.

As I think of the date to affix to my letter, I am reminded that this is the day of the great total eclipse, visible in India, and that several expeditions are engaged in taking observations. The photographic arrangements, I notice, are more than usually complete, and I most sincerely hope that the astronomical photographers are favoured with bright and calm weather, so that they may succeed in obtaining the best photographic representations of the phenomenon. In this I am not influenced by the mere photographic idea of getting a picture, but rather with the hope that photography may be the legitimate and honourable handmaiden to the savants, astronomers, and mathematicians in enabling them to ascertain the constitutional condition, mode of sustenance, and interminable length of life of the great source of all our labours and achievements. Then would the sun write his autobiography, and his amanuensis would be his favoured child, photography.—Yours, very truly,

August 18th, 1868.

LUX GRAPHICUS.

DECOMPOSITION IN THE ACETATE BATH.— PARALYSIS AMONG PHOTOGRAPHERS.

DEAR SIR,—A good deal has been written lately about the uncertainty of the acetate bath. A curious affair that has just happened with me may possibly throw light on some of the difficulties. I do not use the ordinary bath, but

generally a mixture of acetic and carbonate of magnesia, not neutral, but alkaline. The bath in question had been in frequent use for many weeks in conjunction with deep red gold, made so neutral by means of heat that an addition of a carbonate gave no perceptible effervescence. This morning I added some of a fresh sample of gold decidedly acid, and was much surprised in a quarter of an hour by finding the bath *black*. It was clean, though slightly yellow when the gold was added, as it is always filtered after use. I thought that by an accident, which seemed impossible, some iron must have got into it, but on testing some more of the filtered solution with gold or silver and *acid* (either nitric or hydrochloric), I found strong evidence of *formic acid*. Before the acid was added it would bear boiling with gold without change. Silver was reduced by the alkalinity and organic matter. Unless I am in error—and I do not think I am—this shows the advisability of neutralizing the gold *before* adding to the bath, and *not in it*. The bath showed signs of being overworked, and roughened the fingers to an unusual degree.

This suggests the much-talked-of question of health. I do not think toning with the hands with an *alkaline* bath injurious to general health, though a carbonate of soda bath may chafe the hands badly. A neutral or acid bath may, perhaps, be dangerous. But it seems to me a much greater evil consists in a careless use of iron solution. The almost impossibility of washing the hands free from smell after iron suggests its power over the skin, and the occasional after sensations, more than skin deep, suggest the chance of still greater evil.

I think it has been mentioned in the NEWS that iron may cause paralysis, but the fact that so many photographers lay the blame anywhere else, no matter how absurd, must be my excuse for drawing attention to it again.—Yours, truly,

ED. SEELEY.

P.S.—Does not iron make a gaseous compound with hydrogen? I think I have met with it, or it and others, for the smell varies.

Talk in the Studio.

THE QUEKETT MICROSCOPICAL CLUB.—The third Annual Report of the Quekett Club presents a satisfactory record of progress. Amongst many other evidences of the increased interest and success of the Club, the fact that 133 members have joined during the year stands prominent and convincing.

KEEPING PROPERTIES OF GUM PLATES.—Owing to a clerical error in our last, Mr. Gordon is said to have found that gum plates would keep six *months* without deterioration; it should have been six *weeks*, as that period is the limit to which Mr. Gordon has tried them. Mr. Gordon states that he has no doubt whatever that they would keep for that number of months, as the results at the end of six weeks were, if anything, better than those developed on the day of exposure. The limit of his actual experience at the present time proves that no deterioration whatever is found in plates kept four months before exposure, and six weeks after exposure.

ANOTHER SUBSTITUTE FOR NITRATE OF SILVER.—M. Lacan, in *Le Moniteur*, speaks of a new sensitive salt styled *Sel Dubclaroiz*, intended as a substitute for nitrate of silver in printing. The paper for use with this salt, whether plain or albuminized, is prepared without a chloride. The sheets of paper are plunged into a solution of the new salt several at a time. After printing, the proofs are placed in a solution of citric or acetic acid, washed, and then toned, fixed, and washed as usual. The prints are said to be very fine, the paper very sensitive, and the salt one-third cheaper than nitrate of silver. The nature of the salt is, of course, a secret, but from the description of the operation it occurs to us as that possibly it may be a double salt of silver and uranium.

THE GREAT SOLAR ECLIPSE.—Various telegrams give some brief details of the eclipse. At Bombay the eclipse was nearly total, as predicted, but the weather was very unfavourable for observation, and rain fell at the time of greatest obscuration. The eclipse has been successfully observed, however, by two

expeditions at least, though little is known as yet respecting the results which have been arrived at by the observers. Major Tennant states that light fleecy clouds covered the sky, but that the eclipse has been in the main successfully observed. The news is very promising, because his party had undertaken the duty of photographing the eclipse. The Government of India had obtained from England a Newtonian reflector, specially constructed for the occasion, and arrangements had been made by means of which six photographic pictures could be taken during the totality. From the careful manner in which Major Tennant's party had been trained in astronomical photography it is assumed that the photographs they have taken will be eminently valuable and instructive. The communication of M. Janssen states that the eclipse has been successfully observed. The spectrum of the red protuberances which are seen around the black disc of the moon during totality, and which have long since been proved to belong to the sun, has been found to present a very remarkable and unexpected appearance, and a conclusion drawn from the nature of the spectrum is that the protuberances themselves are gaseous.

OXIDATION OF POTASSIUM AND SODIUM.—The oxidation of potassium and sodium, when exposed with a clean surface to the air, is accompanied, according to H. Beaunhauer, with evolution of light.—(*Journ. pr. Chem.* cii. 123).

To Correspondents.

R. R. (New Brunswick).—There are various processes for producing blocks to print by means of ordinary type by means of photography; some are secret, others have been made public; all, or most of them, depend, we believe, upon the reaction of light on gelatine, &c., mixed with a salt of chromic acid, and in all cases the image must be a reproduction from a subject in line or stipple. A thick film of gelatine on glass, impregnated with bichromate of potash, is exposed under a negative to the action of light, and afterwards treated with warm water. This washes away the portions which, having been protected from light, remain soluble, and, at the same time, swells up the portions which, by exposure to light, have become insoluble. The lights of the picture will now be represented by bare glass, and the dark portions by the swollen gelatine in relief. From this a cast is taken in plaster of Paris, in which the lights are in relief and the dark portions are in intaglio. From this plaster cast a stereotype or an electro plate may be taken, which will serve as a block to print from, in the same manner as ordinary type. In some cases—as, for instance, in that of which we recently gave an example by Mr. Frawirth—the processes are multiplied, in order to produce a higher degree of perfection. In some processes the surface is produced by galvanic etching. The metal plates are, of course, as you suppose, mounted on wood like ordinary stereotypes in order to print from. There are several processes of this kind patented, both in this country and in America. Attempts have been made to produce such printing surfaces from negatives taken direct from nature; but, as yet, none have reached sufficient perfection for practical application.

W. J. A. G.—We do not, unfortunately, know of any method of arresting the cracking of a negative when it has once commenced. Revarnishing may do something, but we are uncertain; careful application of the method which Mr. Spiller has described more than once in our pages often restores the cracked film. 2. We shall have pleasure in showing you the Solomon prints.

GEORGE VINCE.—We have never seen any of Mr. Wilson's stereotypes printed as transparencies on glass, and believe that he has not issued them in that form. 2. We do not know of any views of the Holy Land on glass. Messrs. Negretti and Zambra will most probably have them, if any one. 3. We believe that Mr. Breese has not yet disposed of his stock and plant. So far as we know, he has upwards of a hundred subjects, and a still greater number of negatives, as a great many of his are, as you doubtless know, from two or three negatives.

LYTLE'S STUDIO.—We fear from your description that the defect of your collodion is due to the solvent not being sufficiently highly rectified; that is, the alcohol has contained too much water. This is a defect difficult to remedy. Possibly you can work the collodion off by mixing with some made with anhydrous solvents. In working with a collodion containing much water, you may mend matters a little by allowing the film to set very thoroughly before immersion in the nitrate bath. The reticulation and the white opacity in the shadows are both due to the same cause. The white effect and opacity in the shadows may generally be removed by varnishing.

J. A. CLARKE.—Your collodion giving a thin image will doubtless improve by age, and give you density enough; but, in the meantime, you perhaps might get rid of immediate trouble by mixing

with another old collodion. The makers you mention will serve if you get it old. The tendency to get lumpy after working a few plates from a bottle will also disappear somewhat with age, the collodion becoming more limpid throughout. You can secure an immediate remedy by the addition of a little ether to the collodion when lumpy. The print enclosed is an excellent illustration of the sensitiveness of the collodion you made after our formula. We shall have pleasure in trying the new sample if you require further advice upon it.

JUVENIS.—A well-educated young man, who is a fair draughtsman and has a practical knowledge of chemistry, if he adds to these qualities a good knowledge of photography, ought to be able to obtain a respectable living by the practice of photography. It is right, however, to point out to you that photography has, during the last two or three years, been suffering from depression, chiefly in consequence of over-competition. Really skilful men as artistic photographers, if they possess ordinary business tact, will, however, make a respectable living by the practice of the art. We do not recommend you to give up anything else by which you can make a good living, but at present gain as much practice as you can as amateur, employing your leisure time in different branches. If you ultimately make sufficient progress, you might, if you still wished to become a professional photographer, get an engagement in an establishment where you will obtain further experience.

BELMONT.—We have received a letter from "Belmont" enclosing a piece of sensitive paper, referring to some former letter, which, however, we have not received. The paper enclosed exhibits examples of a well-known stain, caused by the silver solution remaining in drops upon the surface, instead of draining and drying off evenly and regularly. The chief cause of this tendency is the use of the paper in an extremely dry state. If it be kept in a damp place for a few hours before sensitizing, the defect will not occur. The use of an extremely strong bath is said to conduce to the same result. When the paper is found to dry thus unevenly, leaving drops standing upon its surface, it is best to blot it off at once, which will prevent the stains occurring without injuring the paper.

J. H. UNDERWOOD.—The view is very charming. Thanks.

J. C. S.—The collodion has arrived safe. Our absence at the British Association meetings has prevented any trial at present, but we hope to make one shortly.

B. M. P.—The sample of pyroxyline is not suitable for a negative collodion. It forms a glutinous collodion, giving a lumpy film with less than 3 grains to the ounce of solvents. It has been made, apparently, with acids at a very low temperature. 2. The proper paper to employ for paper pyroxyline is known as *Papier Joseph*. 3. Excess of ether makes a limpid collodion; excess of alcohol tends to give a somewhat thicker collodion, which flows like oil.

M. D.—For small negatives, flatted crown glass may be used with great advantage; we prefer it, indeed, to plate glass. No surface is finer and harder than the natural vitreous surface produced with the manufacture. It is important, however, to notice that the flatted crown has two sides, one of which is excellent, and the other somewhat rough and imperfect, often causing pinholes. You will easily distinguish the rough side by drawing the finger-nail over the surface.

X.—It is possible with some varnishes to work on the varnished surface of the negative with a B B pencil; but if the surface be glossy, like that given by a spirit varnish of good body, it will not present a tooth to the pencil. The best plan is to treat the negative, after fixing and washing, with a dilute solution of gum, which will present a tooth to the pencil when dry. A little care is necessary, of course, not to scratch it by careless use of the pencil, and also to produce the right result, as the negative must be varnished over the pencil marks before printing. Of course a little skill in drawing—or, at least, in using a pencil with precision—is necessary. If you have little skill in this way, you must venture little in retouching negatives.

F. L.—A metre is a little more than 39 inches; a centimetre is one-hundredth part of a metre; 2½ centimetres are about equal to an inch.

B. T. R.—It is difficult to give an answer to your question as to "which is best, black or brown tones?" It is much a matter of taste. Black tones are best for some subjects, and brown for others. We generally prefer warm tones. The question as to how to get rich deep tones is more easily answered. If you have a really good negative, clean in shadows, and dense enough in the lights, you can obtain rich deep tones, of either black or brown, with almost any toning.

ERRATUM.—In Mr. Lea's article on Testing for Hyposulphite, on page 321, at the end of the eighth paragraph, the word "sulphidric" has been printed "sulphuric," thus destroying the sense of the sentence.

Articles by Mr. Woodbury, Mr. Robinson, Mr. Werge, and several other writers are compelled, by the demand made on our space by papers read at the British Association, to stand over.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Double Salt for Printing without Chloride of Silver	421
Mr. Bing's New Actinometer	422
Visits to Noteworthy Studios	422
Short Essays on Photography and Art. By H. P. Robinson ..	424
On Transferring Negatives. By Walter B. Woodbury	425
Pictorial Effect in Photography. By H. P. Robinson	425
Remarks upon the Retouching of Negatives. By Dr. W. Reissig	428

	PAGE
Photography and the Immured Pompeians. By J. Werge ...	427
Hints Respecting the Production of Clean Negatives in Hot Weather. By L. G. Kleffel	429
Proceedings of Societies—French Photographic Society	439
Correspondence—Photographic Notes on the Continent—The Photographer's Future—Sponging Waxed Prints	439
Talk in the Studio	432
To Correspondents	432

DOUBLE SALT FOR PRINTING WITHOUT CHLORIDE OF SILVER.

WE have during the last few days been experimenting with a printing process, without chloride of silver, which presents points of interest and promise of advantages sufficient to warrant the further attention of experimentalists. The salt employed is a double-nitrate of uranium and silver, and the process does not differ in principle from some of the uranium printing processes which received attention a few years ago; but it varies essentially in some details of practice.

The first claim of the process to attention is its extreme simplicity; and, second, its great economy. The results which are present, the crude products of early experiment, are not inferior to those usually obtained on plain salted paper. As yet we have not tried a paper coated with albumen of a similar body giving a glazed surface; but we have reason to believe that where fine definition and great gloss are required, a paper so treated would give excellent results by this process.

A very weak solution of double-nitrate of uranium and silver in water forms the printing bath. Plain paper, without any previous salting, is immersed in or floated on the solution for a few minutes, and, when dry, exposed under a negative in the ordinary manner. It is somewhat less sensitive than excited albuminized paper, and requires longer exposure. It yields a very vigorous image of a brown tint, the precise colour varying with the sizing material in the paper employed, some samples yielding in the printing-frame prints of a bistre tint, and others of a purple brown; but all readily toning to a warm or neutral-black under suitable treatment, to which we shall presently refer.

One of the most noteworthy circumstances in our operations was the extremely dilute bath with which we obtained good prints. With a solution containing 5 grains of the double salt—practically less than two grains of nitrate of silver—in an ounce of water, we obtained vigorous images; and, so far as we can judge at present, not more than a 10-grain bath of the double salt would be required under any circumstances. With this solution we tried both floating and immersion; but we prefer the results of immersion. The image was, it is true, more completely in the body of the paper, but it possessed more richness than the surface image obtained by floating only. Plain *Saxe* paper gave a light brown image lacking depth; *Rive* paper, re-sized with a preparation of arrowroot, assumed a light brown tint, but gave a more vigorous image. Paper prepared with a solution of gum lac in borax, for Mr. Woodbury's process, gave a rich warm brown print. Turner's Calotype paper gave rich, warm, purple brown prints of great vigour. A sample of toned paper very slightly sized, such as is frequently used for letter-press printing of illustrated books, the texture being fine, although somewhat soft, gave

prints of a rich purple brown, with a tendency to bronze in the shadows. In all these cases it must be borne in mind that we are describing the tone assumed in the printing frame; and in this process, as in ordinary silver printing, the richer the quality of the image in this stage, the more easy it became to secure a fine, deep-toned print in the subsequent operation of toning and fixing.

The toning operations are important, our first experiments having yielded some curious results. The first prints produced we proceeded to tone in the usual manner, first trying a print with a bath made after Mr. Bovey's formula—that is, chloride of gold, a little chloride of sodium, and hot water—the bath being used the following day. The print, on being immersed in the bath, very rapidly began to disappear, leaving finally a faint purple trace of the deep shadows. Another bath was made of chloride of gold, a little chalk, and hot water, and used in the course of an hour, and this gave precisely the same result, as did also another bath made with half-a-grain of carbonate of soda to a grain of chloride of gold in six ounces of water.

In each case the minute portion of silver which formed the image was attacked by the chlorine which was liberated by the chloride of gold in the process of toning, and converted into chloride of silver. It was clear that the ordinary toning baths were not available, nor any toning bath in which chlorine was liberated. We therefore tried the toning bath of sulphocyanide of gold, and this answered admirably, the prints toning readily and satisfactorily, assuming any desired tint, from a purple brown to a deep black; and this answered alike with all the samples of paper. After toning, the prints were fixed in an ordinary fixing solution, losing little if any depth in the process of toning and fixing. As no insoluble salt of silver is present, theoretically, washing well with pure water ought to remove any traces of the unreduced silver salt; but, for safety, a bath of sulphocyanide or hyposulphite is desirable; but it is probable that, from the exceedingly minute trace of silver present, an exceedingly weak fixing bath would answer every purpose.

When finished, the pictures have much the appearance of good plain paper prints. It is probable that paper re-sized with gelatine, or coated with a dilute solution of albumen without salt, would give vigorous images with fine surface definition, and such degree of glaze as might be desired.

The double nitrate of silver and uranium which we used consisted of a small sample placed in our hands for experiment by Mr. Henry Cooper some years ago, which he had prepared with a view to try in collodion for the Wothlytype process, with which the process we have been describing has, as we have said, analogies. To form the double nitrate, concentrated solutions, of nitrate of silver and nitrate of uranium, in the atomic proportions of the two salts, it should

be mixed, and the double salt obtained by crystallization from the mixed solution. The crystals resemble those of nitrate of silver in form, and are of a lemon or citrine tint. To save trouble, those of our readers who wish to make experiments may prepare a solution by mixing the salts in their equivalent proportions in distilled water, and use it without taking the trouble to form the crystals. The atomic weight of nitrate of uranium is 252, that of nitrate of silver 170 grains. If nitrate of silver be dissolved in a quart of water a suitable bath will be obtained.

How far this very simple and economical uranium and silver printing process may be found available for practical purposes we cannot at present say; but it presents, at least, some very interesting points for the amateur and experimentalist.

MR. BING'S NEW ACTINOMETER.

In our last we published Mr. Bing's paper on Actinometry, read in a meeting of Section A of the British Association at Norwich. We have since been favoured with a call from Mr. Bing for the purpose of showing us the new actinometer which he has recently patented. It appears to work perfectly, and to be free from the sources of error which have been found in the actinometers formed of progressive layers of a translucent medium. Mr. Bing, who has experimented considerably with actinometry, states that in all instruments formed on the latter plan the resistance to light by an increasing number of layers of the translucent substance increases much more rapidly than, according to calculation, the increase in the thickness of the translucent substance would warrant. There may be various reasons for this, into the discussion of which we do not, however, now enter.

The new instrument is based upon another principle. It consists mainly of a rectangular tube of non-actinic glass, with an arrangement to bring a strip of sensitive paper into contact with one side of the interior. This tube is placed in diffused light, with its open aperture towards the sky. Light entering the tube and falling upon the sensitive paper commences at once to blacken it, but its power of so blackening is, of course, only in the ratio of the quantity of light which enters, and which necessarily diminishes as it proceeds further into the tube. To make the matter clear, we may here repeat, in Mr. Bing's words, the principles upon which this instrument is founded:—

"1st. That diffused light, on entering a tube at one end only, varies in intensity within the tube inversely as the square of the distances from the aperture where light enters.

"2nd. That any number of tubes, whatever their magnitude, contain the same intensity of light if the ratios of their diameters to their lengths are equal, and if we absorb the light that may be reflected from their sides."

A carefully-calculated scale is fixed inside the tube at the side where the sensitive paper is fixed, the divisions being marked by a portion of a faint standard tint. When the sensitive paper in the instrument has been exposed for (say) ten minutes, the upper portion is darkened, and the first two or three tinted marks on the scale look white in contrast with the darkened paper: as the darkening further down the tube gradually becomes less, the sensitive paper and standard tint appear of the same colour, and below that the paper is seen to be white by contrast with the standard tint.

The principle seems simple and true, and is capable of easy demonstration, as may be seen on carefully reading Mr. Bing's paper. The mode of application is also very elegant. When the specification is published we shall be at liberty to describe more fully the simple and convenient mechanical arrangements of the instrument.

VISITS TO NOTEWORTHY STUDIOS.

WORKING THE EBURNEUM PROCESS IN MR. BURGESS'S STUDIO TENNYSON tells us, in his "Enoch Arden," that "things seen are mightier than things heard." Notwithstanding the lucid statements in reference to his operations in the Eburneum

process with which Mr. Burgess has from time to time favoured us, having now seen the actual working of each part of the process, we have a more complete knowledge than before of the minor details, upon attention to which much of success depends. A circumstantial rehearsal of the operations from the beginning to the end of the process will, we doubt not, prove interesting to many of our readers, and enable those who are disposed, to work out satisfactorily a process yielding results of rare beauty, and one by which we are satisfied both credit and profit may be obtained. We will deal with the operations seriatim.

The Negative does not require special treatment, nor does it require to be used unvarnished. The more perfect it is, of course, the better; but a good negative such as gives good results on albuminized paper answers here. Indeed, in Mr. Burgess's experience, a large number of sitters, after ordering a dozen ordinary cards, also order some Eburneum prints from the same negative. The price Mr. Burgess charges for Eburneum prints, card size, is half-a-guinea for three, and this, as it will be seen, is generally an absolute addition to the amount of business done, which, whilst it is a boon to the customer to obtain a few such choice pictures for special purposes, yields also a considerable increase of profits at the same time that it cements a connection.

The Glass Plates.—Mr. Burgess employs flatted crown as the temporary support for the Eburneum picture, using whole-plates, and producing four impressions on each. The glass is carefully cleaned with rouge and water, the solution being suffered to dry on the plate, and is polished off when dry. Formerly he treated the surface with a solution of wax in ether, in order to facilitate the final removal of the collodion film; but this treatment he has since found unnecessary. If the glass be clean, the collodion suitable, and the operations properly conducted, the film leaves the glass without difficulty.

The Collodion.—The selection of the collodion is of some importance, as it must give an image at once delicate and vigorous, and possess the toughness which renders the final transfer easy and certain. The right qualities are most easily learnt by experience. The collodion must be tough, and it must yield a clean, bright, vigorous image, without any trace of fog. Mr. Burgess uses Blanchard's, which he finds answers perfectly.

The Nitrate Bath is an ordinary negative bath, 35 grains to the ounce, very slightly acid with nitric acid, and in good condition.

The Copying Camera.—Any good copying camera suitable for taking transparencies will serve; but it may be useful to some readers if we reproduce a description of that designed by Mr. Burgess for enlarging as well as copying. It is made of deal, black cloth, and strong elastic, costs about £3, and is so simple that any carpenter can construct one from the accompanying diagrams.

Fig. 1 shows the camera extended to its full length, being 60 inches from the lens to ground glass. A is 24 inches square, slides from one end of the base to the other, and has a projection of half-an-inch at the bottom, which

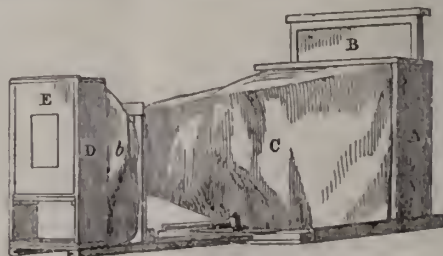


Fig. 1.

slides in a groove, and serves to keep it square. It is held by two screws at the back, which will be seen in the diagram; these simply screw down into the bottom board

without entering it. B is the ground glass. C the extending body made of black doeskin, and is supported by strips of strong elastic, running from each corner. It will be observed that the bottom of the camera consists of two pieces, one sliding into the centre of the other. D is the box for the negative or transparent positive. It is screwed on to two pieces of wood having grooves to fit the smaller part of the bottom of the camera. The grooves may be seen in fig. 2. E is the slide carrying the negative or transparent

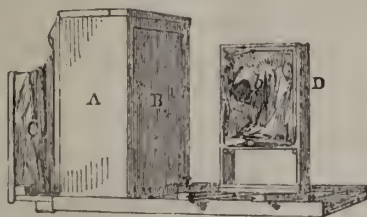


Fig. 2.

positive. B is a hood for the lens; if this is made of black lining (black cotton twill) it will not require any supports. The letters in each figure refer to the same parts.

The negative, generally with an oval mask of black paper in contact, is placed in the slide E, and directed towards the northern sky. A repeating back is employed, so as to produce four images in succession on the plate.

The Exposure depends much, of course, on the negative, the light, and the chemicals. Those we saw exposed varied between ten and twenty seconds. But here is a very noteworthy point to be observed: each successive image is found to require increased exposure. If ten seconds were found to be sufficient for the first, and each succeeding one of the four were also exposed ten seconds, the following three would present indications of under-exposure in increasing degree, the last being hopelessly under-exposed. It is found necessary, therefore, to give each succeeding image about two seconds' additional exposure; the first having had ten seconds, the second receives twelve, the third fourteen, and the last sixteen; and this equalizes the exposure. Some interesting speculations are suggested by this circumstance, but we must here confine ourselves to noting the practical fact. It is well to add that the finest toned pictures are always obtained in a good light.

The Development is effected by means of a 3-grain solution of pyrogallie acid, to which is added 3 grains of citric acid and from 12 to 20 minims of acetic acid. In a recent notice of this developer we omitted to mention the acetic acid; but the image has a tendency to acquire too blue a black tone if the acetic acid be omitted. The extent to which development should be carried in order to secure the desired amount of detail and vigour, and at the same time to avoid burying the image, is most important; but experience is the best guide. The practised eye can distinguish the right stage by looking at it with something dark underneath, better than by looking through it in the mode a negative is examined. If the development be stopped too soon, the image lacks detail, and the blacks are not vigorous; if it be carried on too long, much of the detail becomes buried in the blacks, and is not visible by reflected light. As a rule, the development is more rapidly conducted with the transparent positive than is necessary with a negative. It is imperative that the transparent parts be free from foggy deposit. Mr. Burgess fixes in cyanide.

Toning.—After well washing the fixed image it is toned with a neutral solution of chloride of gold, or rather of the double chloride of gold and sodium, which is the salt Mr. Burgess employs. He uses a solution containing a grain of the gold salt in a drachm of water, without any addition. This is poured on to the plate, and in less than a minute the surplus is poured back into the bottle, the

toning action having generally passed quite through the image in that time. To examine the picture thoroughly a very convenient plan is now adopted. A sheet of white paper is made wet and brought into contact with the wet film. On examining the back of the glass, through which the image is seen against the white paper, it is easy to ascertain if the toning process has been carried far enough, and also whether the print is in all respects sufficiently perfect for finishing.

Varnishing.—After rinsing and drying the picture it is varnished with Solmsee varnish. This part of the process was at one time omitted, but Mr. Burgess has found that the image is more brilliant and perfect if varnished at this stage. The operation involves a little risk, for if an unsuitable varnish be employed, it permeates the film and causes it to adhere to the glass, rendering the final removal difficult. Mr. Burgess has found this occur with some varnishes, but never when the Solmsee varnish is employed.

Retouching.—Defects may now be removed by retouching delicately with a little suitable water colour. Matt silver stains, or other opaque spots or markings, may be scraped away, and so rendered imperceptible in the finished print.

Applying the Eburneum Preparation.—The varnished picture is now ready for the Eburneum coating. Strips of paper an inch wide are coated with a stiff paste (Mr. Burgess uses gum tragacanth). The paper he employs is that which is silvered on one side, and is usually sold by fancy stationers for ornamental uses. It is selected because, whilst it is very pliant, it is also tough, and not readily permeable to moisture. An ordinary paper, pliant enough for easy working, is often so soft and permeable that it bursts away on contact with the hot gelatine solution. It is attached to the back of the plate, leaving about a quarter of an inch to turn up round the edges, and so form a kind of dish of about one-eighth of an inch deep, of which the film forms the bottom. It is then carefully adjusted on a levelling-stand to receive the solution.

Although we have before published the recipe for the preparation, we will, for the purpose of giving completeness to this article, repeat the formula precisely as it is now used:—

French gelatine	...	...	...	5	ounces
Water	...	...	...	20	"
Glycerine	...	...	...	$\frac{1}{2}$	ounce
Oxide of zinc	...	...	...	1	"

The French gelatine is sold in thin, nearly colourless sheets, and is found tougher and better for this purpose than Nelson's, whilst it is about half the price. It is soaked in the water, dissolved by gentle heat, and filtered through flannel. The oxide of zinc is placed in a mortar with the glycerine and a little of the water, and thoroughly incorporated. It is then well mixed with the warm gelatine. It is desirable to keep the preparation warm and liquid for some hours—say six or eight—in order to permit the complete subsidence of the coarser particles of the zinc white. When this is done, and the gelatine has been suffered to cool, the mass may be lifted out of the jar, and the bottom cut off, which will remove all the coarse portion at once. If sufficient time for this subsidence is not allowed, the layer of Eburneum will appear coarse and granulated. If the solution be kept warm too long, too much of the zinc white will be deposited, leaving the Eburneum too transparent; it will lack the solidity and brilliant whiteness which should characterize it.

This preparation is kept in stock, and a portion warmed by placing it in a jar in a pan of water over a fire when required. It is best used at a temperature of about 100° Fah. About two ounces are sufficient to cover a whole-plate to the proper depth. When the solution is fluid, about two ounces and a-half are placed in a cup and set aside for a few minutes. This is an important point. Whenever a gelatinous solution is poured from one vessel

except in patent medicines. Everybody's enlargements are the most perfect ever produced; everybody's collodion is perfect; but one maker, who does *not* appear in the *News*, advertises collodion which is more perfect than the most perfect; but then the maker is an exceedingly clever and honest man, who would not mislead his brother photographers for the world, more especially when he was selling them. The advertising colourists are philanthropists in their polychromic way; they will supply you with "most exquisite finish, ivory-like and brilliant, by first-rate talent," for the small price of sixpence a carte. But I am off the rails again. Let us resume, as poor Artemus Ward used to say.

In turning over the advertisements of the *News*, announcements similar to this will often be found:—

TO OPERATORS.

WANTED, a Young Man, must be a competent Artist, of gentlemanly manners, a good Poser, and be able to take a faultless negative. Will be expected to make himself generally useful. Send carte of self, &c. None but the most competent need apply, as this is a permanency. Wages, £1 5s. per week. Apply, &c.

For twenty-five shillings a week a competent artist and a gentleman is expected to make himself generally useful! For this miserable sum the man who, if he answered the terms of the advertisement, should have great chemical knowledge added to careful artistic culture, and, perhaps, a college education, is expected to be the drudge of, possibly—even probably—some ignorant fellow who has, let us say, a little bazaar for fancy goods and toys, or a tobacco shop, to which he wishes to add a photographic "gallery," managed, under his superior direction, by five-and-twenty shillings' worth of gentlemanly manners, good posing, and general usefulness. And is this what the noble art of photography is coming to? Is it come so low that perfection in its practice, added to other virtues, are expected to be obtained for a porter's wages? I do not object that five-and-twenty shillings are not enough for a vast quantity of those who have taken up photography; there are, or were, plenty of "doorsmen" of photographic dens who only got ten or twelve shillings a week, which was as much as they were worth; and there are many respectable men who are only worth a small salary; but advertisers of the class I have named have so singular a notion of photography, that when they insert such advertisements in the papers they actually think that they will procure what they advertise for, and are content to suppose that the results produced are the finest in creation, and that the pictures turned out of their establishments represent photography in its highest phase.

I strongly condemn the operation of trade unions; but surely, if anywhere, a standard of ability and a standard of remuneration are required at present in photography!

ON TRANSFERRING NEGATIVES.

BY WALTER B. WOODBURY.

It is now a considerable time since, at a meeting of the Manchester Photographic Society, I explained in detail a complete method of taking the negative from the glass on which it had been taken by means of a stout leathery collodion. Since that time I think I may safely say that few have thought it worth while to trouble themselves to try it. I see, however, that M. Marion is again describing the same method as new, and hope that attention will be more fully called to its importance. How many thousand pounds worth of plate glass is now lying idly by! I am told of one large house in France that reckon their stock of negatives—or, rather, the plate glass on which they are taken—at a value of £6,000; and the storage and care of these negatives is not by any means an inexpensive matter. Now, were these negatives transferred to collodion, the space they would require would be nothing, and the photographer would not have his £6,000 lying useless.

Since writing the paper mentioned above on the subject,

I have made some rather important modifications: I found that the coating of india-rubber used to prevent dissolution of the negative by the leathery collodion was not always sufficient to do so, and, besides, that we introduce a changeable, uncertain body into the film, which might afterwards tend to destroy it. Having had varied experiences with the use of india-rubber, I am led to believe that for any permanent work the less we have to do with it the better. What I have found to answer much better for the purpose under consideration is a weak solution of gum, as the smallest proportion seems sufficient to prevent the solvents from acting on the film beneath. When the negative is taken, and after the final washing, the gum-water should be poured on and run over, and then thrown off, and again a second lot applied. It should now be allowed to dry, and then placed on a stand truly levelled, and the transfer collodion poured on. When dry the whole is left to soak in water till the negative detaches itself from the glass. To facilitate this I formerly recommended a coating of wax to be applied before taking the negative, but this I find unnecessary, as, sooner or later, the action of the water will separate the double film from the glass. Some care will be necessary in drying the film when it has left the glass, otherwise it will cockle and assume a shape difficult to flatten again. The best way will be to place it between sheets of blotting-paper under pressure until dry, when it will always after remain flat. Apart from these transferred negatives having the advantage of lightness, the saving of glass, &c., there are others of sufficient importance. With such negatives we can print from back or front with equal sharpness, which, for most engraving and other like processes, is of great value. For decorative work, beautiful designs may be made by photographing a leaf or group of leaves, or of flowers, and printing the image double, one side being reversed: some very useful studies for designers may by this means be produced: kaleidoscopic designs may also be made by extending this principle.

Of the use of transferred dry-plate films for convenience of travel, I shall have something to say on a future occasion.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAOSCURE FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXXII.

THE principles of composition and chiaroscuro having been stated, it will be of use to the student to have pointed out to him how these rules have been observed or neglected in various examples; I, therefore, in this and the following chapters intend to give illustrations from pictures or drawings, as widely diversified in character as possible, with critical remarks on their construction.

My first example is one of those clever book illustrations which have done so much to familiarize the present generation with good art, and which give us enormous advantages over our fathers—who had to give a great price for inferior artistic work—in our opportunities of study. The great advance in the practice of wood engraving has done more than anything else to bring true art home to the people.

The present example is a somewhat hard and formal illustration of angular composition, and shows much clever mechanical arrangement without any subtlety. In this the art is shown almost boastfully, when it should have been the artist's endeavour to suppress too great a parade of knowledge. But it is better to have too much art than none at all, and this example is better for our purpose than one more delicately arranged, because the arrangement is more visible to the student.

We will now proceed to analyze the construction of the lines of this picture.

First, then, observe that the leading lines and points of all the figures run into one another so as to form a series of pyramids or parts of pyramids. The central head—that of the old lady—forms the apex of the first pyramid, which is supported by the two little girls on each side of her; the

diagonal lines of this group, crossing at the top of the grandmother's head, run on the one side to the old man's hat, which crowns the group, and on the other is continued by the figures coming through the door. The pyramid capped by the old man is formed on the right hand side by



the arm of the child he is holding, who reaches down to her brother's head. The dark dress of this boy forms an important mass in supporting the composition; this mass is repeated on the other side by the velvet jacket of the girl looking up. It will be observed that some trouble has been taken to form another diagonal line here with the three children's heads. The arm of the boy in the black velvet dress, cut off as it is by the side of the picture,

appears to me to be a very serious defect in the composition. The upright lines of the door contrast with the flowing lines of the figures, and give stability to the whole. It may be taken as a rule that a few straight lines in a composition, by contrasting with the curves, always add to the general effect.

The smaller illustration, from a drawing by F. W. Topham, belongs to a much higher order of art than the larger

example. This also is constructed on the pyramidal form of grouping, and is so arranged as to admit of very effective chiaroscuro. It will be noticed that the deepest dark is brought into immediate contact with the highest light,

while the other portion of the picture is kept in varying but intermediate tones, thus securing the greatest amount of brilliancy and breadth. It is probable that in the original drawing the sky seen through the open door was



more subdued in tone. There is a sentiment in the composition and chiaroscuro quite apart from, yet very suitable to, the subject.

PHOTOGRAPHY AND THE IMMURED POMPEIANS.

BY J. WERGE.

EVERY one must be sensible of the many and varied applications of photography. Even photographers themselves, familiar as they are with the capabilities of the art they practise, must necessarily have their wonder excited occasionally at the scope of their art-science, especially when they consider that the process as practised at the present day is not more than seventeen years old. That it should be the historian of the life and manners of the present period more fully and faithfully than any written account is not so much a matter of surprise. Appealing, as it does, to the vanity and affections of the people, it is at once a recorder of the changes of fashion, a registrar of marriages, births, and deaths, and a truthful illustrator of the times in which we live. But that it should be brought to bear upon the past, and make the inhabitants of the world in the nineteenth century familiar with the forms, fashions, manners, life, and death of the people of the first century of the Christian era, is something to be marvelled at, and at first seems an impossibility. Yet such is the fact; and photography has been made the cheap and easy means of informing the present generation of the manner in which the ancients behaved, suffered, and died in the midst of one of the most appalling catastrophes that ever overtook the inhabitants of any part of the world, ancient or modern, as vividly and undeniably as if the calamity had occurred but yesterday.

The foregoing reflections were excited by seeing very recently some photographs from plaster casts of the forms of human beings as they had fallen and died when Pompeii and Herculaneum were destroyed by the first known and terrible eruption of Mount Vesuvius. The photographs alluded to reveal with a fearful fidelity the dreadful agonies of some of those who perished at Pompeii, and, while looking at the pictures, it is very difficult to divest the mind of the idea that they are not the works of some ancient photographer who plied his lens and camera immediately after the eruption had ceased, so forcibly do they carry the mind back to the time and place of the awful immurement of both a town and its people.

That these photographs were not obtained from the lifeless forms of the Pompeians the reader will readily understand, for their bodies have not been preserved entire from that

day to this. The question then naturally arises, "How could plaster casts be obtained from which the photographs were produced?" To answer that question I must briefly explain that Pompeii was not, as is generally understood, destroyed by an overflow of red hot lava, which would have burnt up every particle of human flesh with which it came in contact almost instantly, without leaving a mould or impress of the form which it surrounded. The black mud which flowed from Vesuvius into the doomed town of Pompeii entombed the houses and inhabitants—covered them up and formed a thick crust over them, which gradually hardened, and as the bodies crumbled away to dust a mould or matrix was left, from which plaster casts of great beauty and finish might have been obtained of almost everything that was destroyed. Unfortunately, this was not discovered until very recently, after many of the beautiful moulds had been destroyed by the process of hurried, thoughtless, and unsystematic excavation. It was only a short time ago, since Naples was united to Italy, that careful and intelligent excavation secured to future generations impressions from those matrices made by the most terrible process of natural mould making.

Sig. Fiorelli, who was appointed superintendent of excavations at Pompeii, happily thought of obtaining casts from these natural moulds by pouring in soft plaster of Paris, and thus secure more useful mementoes than by preserving the moulds themselves. Amongst the first casts thus obtained were the forms of four human beings, described as follows in the *Quarterly Review* for 1864:—

"These four persons had perished in the streets. Driven from their homes, they sought to flee when it was too late. These victims of the eruption were not found together, and they do not appear to have belonged to the same family or household. The most interesting of the casts is that of two women, probably mother and daughter, lying feet to feet; they appear from their garb to have been people of poor condition. The elder seems to lie tranquilly on her side, overcome by the noxious gases. She probably fell and died without a struggle. Her limbs are extended, and her left arm drops loosely. On one finger is still seen her coarse iron ring. Her child was a girl of fifteen; she seems, poor thing, to have struggled hard for life. Her legs are drawn up convulsively. Her little hands are clenched in agony. In one she holds her veil or part of her dress, with which she had covered her head, burying her face in her arm, to shield herself from the falling ashes and from the foul sulphurous smoke. The form of her head is perfectly preserved. The texture of her coarse linen garments may be traced, and even the fashion of her dress

with its long sleeves reaching to her wrists. Here and there it is torn, and the smooth young skin appears in the plaster like polished marble. On her tiny feet may still be seen her embroidered sandals. At some distance from this group lay a third woman, apparently about the age of twenty-five, and belonging to a better class. Silver rings were on her fingers. She lay on her side, and had died in great agony. Her garments had been gathered up on one side, leaving exposed a limb of the most beautiful form. She had fled with her little treasure, two silver cups, a few jewels, and some silver coins, and her keys, like a careful matron. The fourth cast is that of a man of the people, perhaps a common soldier. He is almost of colossal size. He lies on his back, his arms extended by his side, and his feet stretched out, as if, finding escape impossible, he had laid himself down to meet death like a brave man. His dress consists of a short coat or jerkin and tight-fitting breeches of some coarse stuff, perhaps leather; heavy sandals, with soles studded with nails, are laced tightly round his ankles. On one finger is seen his iron ring. His features are strongly marked, his mouth open, as in death. Some of his teeth still remain, and even part of the moustache adheres to the plaster."

Such is the description of the plaster casts; and the photographs which I possess of those casts convey to the mind at one glance all that is there written. Wonderful photography! How eloquent in their silence are thy pictures! To what more dignified and sublime uses could any art be put? Only a few can look upon those casts of the dead Pompeians in the Museum at Naples, but the whole world may view the photographs taken from them, and look upon the Pompeians in their forms and habits as they died, and read a page from the unwritten histories of those terrible death-struggles, when the strong man, the tender placid mother, and the young and delicate maiden were all entombed in that fearful sea of mud, amidst darkness and horrors that can never be adequately described.

Such an awful catastrophe will never cease to interest the student of ancient history, and photography will now be the means of deepening his interest, and revealing to his mind with greater force and lucidity many scenes that actually occurred at the very moment of the appalling destruction of Pompeii, on the 24th of August, A.D. 79.

REMARKS UPON THE RETOUCHING OF NEGATIVES.

BY DR. W. REISSIG.*

THE retouching of negatives is a subject which is everywhere regarded as of the greatest importance, and already in the *Photographische Correspondenz*, as likewise at the meetings of the Viennese Photographic Society, the various technical methods which have been proposed have been widely discussed. It is my intention here not to go farther into the technical portion of the subject, but to content myself with briefly considering the suitability and permanence of the materials employed in the process of retouching.

In printing from several negatives which have been produced with the same collodion, silver bath, exposure, &c., but which have been developed in the first case with iron and silver, secondly with pyrogallie acid and silver, thirdly with corrosive sublimate,† fourthly with corrosive sublimate and subsequent treatment with ammonia or sulphide of ammonium, and fifthly with Selle's intensifier, it will be found that the plate developed with silver alone will yield the softest pictures. This indisputable fact is, in my opinion, accounted for in the following manner:—The very finely-divided silver particles composing the negative are spread over the plate in several more or less dense layers, and not only does a certain amount of white light make its way between the different particles, but, through the latter themselves, a

small quantity of blue light penetrates. That this is the case may be proved by taking an extraordinarily thin beaten leaf of silver, or a sheet of glass upon which a thin film of silver has been attached, and holding them against the light, when objects may be easily seen through the same, but surrounded by a blue light; sensitive paper may also be blackened by light transmitted through thin layers of silver of this description, though naturally with more or less difficulty. If through the more dense portions of a negative no light is able to penetrate on account of their intensity, it is, nevertheless, not to be doubted that, in the half-tones, not only does light make its way between the particles, but the latter likewise allows blue light to pass, the powerful chemical action of which upon sensitized silver paper is well known.

If corrosive sublimate alone is used for intensifying, a violet subchloride of silver is formed, together with calomel, which—so it appears to me—allows less light to pass between the particles, and, although white, is less transparent than the varnish. The brownish-black sulphide of mercury, the perfectly opaque suboxide of mercury, carmine, &c., all allow either none or but very little light to pass, and this of no— or, in the case of carmine, very little—actinic power.

As before stated, I attribute to the particular behaviour of the silver the fact that the softest and most harmonious pictures are obtainable from negatives which have been developed with silver only. This, therefore, points to the conclusion that, theoretically, very finely divided silver is the most suitable material to be employed for retouching. Precipitated silver is, however, of different kinds, according to whether it has been reduced from nitrate of silver by a solution of iron, or pyrogallie acid, the difference being easily discoverable with the naked eye. That prepared by treatment with a solution of iron is of a whitish colour, the whiter and more metallic it appears the more acid (acetic acid, nitric acid, &c.) having been used in its reduction; the precipitate induced by pyrogallie acid is of a bluish-black tone when viewed in large quantities. The precipitates are not only different in appearance, but likewise different in their chemical constitution, for they are by no means allotropic forms of the pure metal. The first almost always contains sulphate of iron, if only in minute quantities; and the second consists of an organic body in combination with the metallic silver.

Of the presence of this organic body one may easily be convinced. If a dilute solution of nitrate of silver containing actually an appreciable quantity of nitric acid is precipitated by means of a pyrogallie acid solution containing acetic and citric acids, it is very difficult to obtain the warm water which runs off on washing the precipitate of a perfectly colourless description. It may now be thought that the silver is perfectly pure. That this is far from being the case may be proved by digesting some of the silver powder in a warm and very dilute solution of cyanide of potassium, when the fluid assumes a very appreciable wine-colour, and the silver itself becomes of a lighter hue; this operation must, in fact, be repeated several times before the cyanide solution remains perfectly colourless. As silver dissolved in cyanide of potassium yields a colourless solution it is clearly shown that another body of organic origin must be in combination with precipitated silver, reduced by means of pyrogallie acid. A cyanide of potassium solution, even of a very dilute description, is capable of taking up finely-divided silver, and, therefore, determination by means of analysis is impracticable.

The presence of an organic body in the silver film of a negative which has been intensified with pyrogallie acid, is, I may mention, no doubt the principal reason why such negatives become darkened by time, and do not retain their original intensity, as is the case with those treated with an iron developer only. The organic body doubtless suffers modification as the influence of the varnish becomes exerted upon the silver, and those negatives run the most risk that have been developed by means of pyrogallie solution and the liquid from old sensitizing baths, inasmuch as the latter

* *Photographische Correspondenz*.

† Bichloride of mercury.—Ed. P. N.

contains iodide of silver; thus, beside an organic body, an iodide comes upon plate, which, being precipitated by the pyrogallic solution and decomposed by the action of light, causes a profound change to take place in the silver film. Every one of my readers has, no doubt, observed that in intensifying a negative of which some of the parts have not been properly fixed (the edges and corners of a plate, for instance), and are, therefore, covered with iodide of silver, such portions darken in the light, forming deep black marks upon the negative. In the same manner, but, of course, in a less degree, this decomposition of the iodide takes place upon negatives covered with silver in contact with an organic body, and thus, in time, the black marks we observe upon most plates are produced by the action of light. For this reason I would warn photographers not to employ old negative baths for the purpose of intensifying; it is best first of all to precipitate the iodide of silver by adding a large quantity of water, and then to filter and concentrate the solution again by evaporation. Better still, take pure nitrate of silver solution for the purpose. Unfortunately, all negatives intensified with pyrogallic acid will darken by time, for treatment of the same with a warm solution of cyanide of potassium is impracticable, because, in the first place, the negative is thereby rendered much weaker, and, secondly, because it is difficult to treat the collodion film with a warm liquid without running considerable risk of tearing it.

By submitting the plates to the action of great heat the object would, no doubt, be accomplished, as a high temperature would have the effect of decomposing an organic body; but there would always be formed upon the negative, where the silver adheres to the glass after the destruction of the collodion, a silicate of silver, which would influence the strength of the negative. In practice it would scarcely answer to treat all negatives in this manner, and the encaustic method as at present employed is certainly more advisable, as the original picture cannot then be destroyed.

But to return to the subject of retouching. When the finely-precipitated silver has been mixed with gum and applied to the plate, there need be no fear of any change taking place if the negative remains perfectly dry. At the same time, the variations of temperature to which a negative is exposed during the process of printing in damp and cold weather, being taken from a warm locality into a cold one, or *vice versa*, causes a deposit of moisture upon the surface of the gum and varnish. Once moist, a decomposition of the gum and incorporated silver powder takes place, and if the latter has been obtained by precipitation with a solution of iron, the trace of sulphite of iron becomes basic by giving off sulphuric acid, which soon destroys the cementing materials; besides, the moist gum upon the surface of the negatives may likewise suffer decomposition by coming into contact with the nitrate of silver upon the sensitized paper. These experiences, referred to by M. H. Benqué and others, have caused me to investigate the matter, to obtain, if possible, in the first place, absolutely pure metallic silver in the finest state of division, and, secondly, another cementing material in the place of gum.

With regard to the silver, I first endeavoured to obtain the metal by means of the electrotype process; the method is a good one, but very laborious. It led me to the idea of using the silver powder which is manufactured in bronze factories, and which is of a very fine description, and styled "genuine silver powder." By beating the metal into thin sheets, and afterwards grinding it between large stone rollers (a concentrated solution of gum being added during the process), a powder of extraordinary fineness is obtained, from which the coarser particles have been separated by careful levigation. With this so-called silver-bronze, retouching may be carried on. I possess negatives which were thus retouched with gum four years ago, and which are still quite perfect, although they have, of course, been subjected to but little usage. At the same time, the purchase of this description of bronze is often open to question

if the source whence it comes is doubtful and it is not obtained direct from the manufacturer. Sometimes the powder is prepared by boiling chloride of silver in an alkaline solution of cane sugar, and in this case the silver product contains traces of undecomposed chloride of silver. It is obvious that a silver of this description should not be used. If it is desired to use powdered silver, of the purity of which one is convinced, it is best to precipitate a very dilute solution of nitrate of silver (free from iodide of silver) with the well-known pyrogallic acid solution; the latter should be used in excess, and the mixture well shaken, and, finally, the precipitated powder carefully washed, and afterwards digested in a lukewarm three to five per cent solution of the purest cyanide of potassium. The last operation is continued until the cyanide solution remains perfectly colourless, when the same is poured off, and the powder well washed with water. The process is somewhat laborious and elaborate, but by its means a very pure and reliable product is obtained.

That the employment of gum as a means of retouching is injurious we have already mentioned. Fortunately, the silver powder may be applied with oil of turpentine in the same manner as it is with gum, excepting that with the former its manipulation is somewhat more difficult, and its odour less agreeable; the oil of turpentine, which evaporates and becomes resinous, is unquestionably the best cementing material, but alterations and removals are by its means somewhat difficult of execution. Whether it is owing to these facts or not, I do not know, but in most of the studios photographers prefer to work with carmine, a substance easily obtained, and one which allows of easy removal in the case of bad workmanship, and is safely protected from alteration by moisture by the application of another coating of varnish.

Of special importance is the process of M. A. Angerer, which is mentioned in M. Benqué's work, but which I myself had independently become acquainted with—viz., the process of retouching with graphite. A pencil, Faber No. 1, is rubbed upon a stone, and the powder thus obtained (containing either gum or resin) is applied to the negative by means of purified oil of turpentine. This process I have simplified considerably by employing the very fine powdered graphite, such as is used in the electrotyping process. It is impossible to prepare a finer or more uniform product than the powder I employ, and which, through the influence of a friend, I have been enabled to obtain direct from the manufactory of M. Faber in Nuremberg; I have no doubt that photographers would experience no difficulty in obtaining such supplies of the material as they may require for retouching purposes from the same source.

HINTS RESPECTING THE PRODUCTION OF CLEAN NEGATIVES IN HOT WEATHER.

BY L. G. KIEFFEL.*

DURING hot weather we are accustomed to hear from all sides complaints of irregularities which constantly occur in the production of negatives, and these defects, which generally take the form of streaks, fog, and dark spots in the shadows, are not unfrequently attributed to the inferior quality of the collodion. That this is, however, far from being the case, may be proved by the fact that if the collodion is changed these imperfections still remain, and their production is, therefore, shown to be due merely to the association of certain causes arising from the great heat of the weather.

Fortunately, there are several methods whereby these failures and cares of the photographer may be removed, and I trust that the mode of proceeding here indicated may prove welcome. One of the most important preventions against unclean working is to place the collodion, sensitizing bath, and developer in a metal refrigerator, or metal vessel filled with ice or cold water, and to allow them to re-

* Photographische Mittheilungen.

main therein for some time previously to their employment. But another, more reliable, and at the same time more convenient method, is that indicated in an earlier edition of my manual, and which is as follows:—

When the coated plate is withdrawn from the sensitizing bath, it is placed in a porcelain dish filled with distilled water, and washed in the same for a period of from thirty to sixty seconds, to remove all trace of the silver solution from its surface. When this is accomplished, the plate is again dipped into the silver bath for the period of one minute, in order to re-sensitize it, and then exposed. On pouring on the developer it will be seen that the liquid flows easily and with great regularity over the whole picture, and also that the negative, if properly exposed, is developed very evenly, and does not become evident by fits and starts, especially in the background or in the sky of the landscape. A more certain result even will be obtained if the plates are not dipped a second time into the same bath, but are treated in a different one.

The same distilled water may be used for several dozen plates without any fear of injury; the film of iodide of silver gains in sensitiveness by the use of the second bath.

Proceedings of Societies.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held on the 3rd ult., M. BALARD, President, in the chair.

M. DESPAQUIS presented the Society with a sealed packet containing specimens of his new sensitive material denominated *collodion cuir*, which he requested might be kept in the custody of the Society for the period of a year, to ascertain its capacity for being preserved in good order for a lengthened time.

The PRESIDENT thanked M. Despaquis, and stated that the material should be preserved as proposed.

M. ROMAIN-TALBOT submitted to the inspection of members specimens of vertical and horizontal baths, manufactured at Berlin, of moulded glass; they are less weighty than those at present made, and likewise more perfect in shape.

M. LIERISSEL presented the Society with a new description of portable dark frame for dry plates of his own invention.

M. CLOUZARD read a communication respecting certain improved apparatus which he used in conjunction with his portable laboratory, when photographing in the open air. Among other apparatus, he described a bath for sensitizing plates in full daylight, and also a bath and dark frame combined.

M. LE COLONEL AVET exhibited a collection of photo-engravings of views taken from nature, and likewise of maps reduced and enlarged. They were produced by a process recently patented by the Colonel.

M. PLACET stated that on examining two or three negatives which accompanied the collection, it appeared to him that the process consisted of pouring upon the negative itself a layer of bichromated gelatine, which, on exposure to light, furnished the necessary relief required for engraving. If this were so, the process was not new, having been published as far back as 1860 or 1861.

M. ANTHONI communicated to the Society some improvements which he had effected in his portable laboratory, and by means of which he was able to carry on the processes of development and intensifying while regarding the negative as a transparency, and also to wash the same without exposing it to the action of light.

The Society thanked M. Anthoni for his communication.

The proceedings then terminated.

Correspondence.

PHOTOGRAPHIC NOTES ON THE CONTINENT.

[FROM A SPECIAL CORRESPONDENT.]

Munich, 20th August, 1868.

AFTER a fortnight's tramp over hill and dale, among glaciers, mountain torrents, rocky gorges, and lofty peaks, sleeping now in some chalet or simple village inn, and now in a roughly-built

auberge on some elevated mountain-top, it is not unpleasant to indulge again in the comparative luxuriousness of a well-furnished room and a comfortable hotel, and to partake of fare somewhat more palatable than that furnished in these remote districts. Mountain life in the Tyrol is certainly very delightful, and the people to be met with are, on the whole, intelligent and pleasing, but of course one cannot expect a journey undertaken in a foreign country to be absolutely free from slight troubles and annoyances; everything one encounters does not always appear *couleur de rose*, and one's resting places are rarely so soft and sweet-smelling as to be comparable to a bed of roses, except as regards the fact of both being generally afflicted with specimens of entomology. The bread is one of the most serious discomforts in the Tyrol and its vicinity; rye bread I can eat, even when the same contains a good third of vetch-flour; and the veritable black *pumpernickel* of the Thuriagian peasant I have lived upon for months together; but the nauseous composition sometimes met with in these regions, invariably flavoured either with a large quantity of caraway seeds, aniseed, or fennell, becomes, after a few days, simply an intolerable abomination.

Ever since leaving Heiligenblut the climate has been much warmer, and in some of the valleys the heat is very intense. Maize is grown to an enormous extent in the lowlands, and the roads are often bordered with Spanish chestnuts, while other evidences of a warm sun are apparent. The scenery of the Upper Pusterthal, with its noted Dolomite mountains, is very fine, and of a totally different description to that of the Salzkammergut. Then there is the Tanfers Valley, with the magnificent Tanfers glacier at its head; and beautiful Ennerberger vale, which is but three German miles long, and in which three different languages are spoken, viz., German, Italian, and Romansch. At Franzesfeste, a large fortification at the foot of the Brenner, built by the Austrians to defend the pass, our journey on foot came to an end, and we availed ourselves of the railway, which has been recently opened, to bring us over the Brenner to Innsprich, and afterwards on here.

The Brenner railway passes over a height of more than 4000 feet, and is worked, even at the steepest inclines, which amount to one in forty, with locomotives and carriages of the ordinary construction fitted with suitable breaks. Since the rails have been laid down over the pass the traffic has increased almost beyond credence. Twelve months ago one diligence was sufficient to carry the whole number of passengers to their destination; and now three trains, of eight or twelve carriages, pass daily from one side to the other. The line is worked with great ease and regularity, and is without doubt a very successful undertaking.

After Vienna, Munich is the most important town of South Germany; it is the capital of Bavaria and residence of the king. A very beautiful city it is, with some very fine palaces and churches, and a gallery of paintings which is considered one of the most important in Europe. The late king was a great art student, and made it one of the duties of his life to organise an extensive collection of artistic productions; and it is these museums and galleries that have rendered Munich one of the most popular and remarkable cities on the continent.

Permission has been accorded to copy by photography any of the royal or public paintings. Many photographers have availed themselves of this privilege, and reproductions of the most celebrated pictures in the galleries are to be seen in printsellers' shops. These copies are, however, for the most part very small, the majority being only carte-de-visite size, and the details are, therefore, so small as to render the photographs in some cases perfectly useless. Some large copies, measuring about 12 by 15, which I saw, were everything that could be desired, and were very good substitutes for the originals.

In regard to portraiture, Munich enjoys some considerable reputation. The town includes at least half-a-dozen artists of first-rate order, their productions being, in general, quite equal to those of the best Viennese photographers. Cartes-de-visite are still the favourite formula, but cabinets seem to be coming into fashion gradually and surely. Among other specimens I noted some very beautiful pictures by M. Possenbacher, whose large heads are remarkably fine. Some of the latter appeared to have been taken by the camera direct, while those of extraordinary size were, of course, enlargements. M. Reitmayer's specimens were, for the most part, also very good, consisting chiefly of pictures of smaller size.

The prices asked at the different studios are remarkabl

reasonable, seeing that in most cases the work turned out is of a superior quality. They are lower even than at Vienna, where the charges asked were, as I mentioned in a previous letter, much less than those of Paris or London artists. This can only be accounted for on the score of cheaper labour and materials, for there does not appear to be so much—or, any rate, more—competition existing among photographers as there is in this country. Of course our friends over here know their own business better than strangers, but yet I certainly think that the prices are much lower than they need or ought to be, and that the good work turned out should be made to bear a larger profit than that at present realized, which, in some cases, must be very small indeed.

Cologne, August 22nd, 1868.

If anything has done good service to photographers in the capacity of a model it is certainly Cologne Cathedral. The two compulsory things—and the only two—to be done by visitors to Cologne, is to see the *Dom*, and to buy *eau de Cologne*; and as half of the inhabitants of the town appear to be ticket porters and touts, the stranger who wishes to fulfil neither of these duties runs a very fair chance of being hunted down and lynched. Never was there such a nuisance as the Cologne commissionaires. If you do not want an hotel, he volunteers to show you the *Dom*; or, failing that, will at once insist upon leading you off to one of the innumerable shops where the only veritable *eau* is. Under these circumstances it is somewhat monotonous to observe in the shops pictures and photographs of the *Dom* of every size, taken from every point of the compass. The *Dom* from the north, from the west, from the front, back, north front, west front; the *Dom* as it was; the *Dom* as it will be, &c., &c., and so on *ad nauseam*.

I was glad to see a large quantity of Braun's carbon prints on sale, both of large and small size. The prices were in every case as low as, or even lower than, those of silver prints, many of the smaller carbon pictures being obtainable at the small charge of sixpence. Some of M. Braun's views of the Rhine are very good, and are the only series that can at all compete with the pictures of Mr. England.

The portraiture in Cologne cannot compare with the larger towns of South Germany, but is nevertheless of very fair merit. The cabinets are much in favour here, and seem to have beaten cartes quite out of the field. Some pictures by M. Haase were very soft and brilliant, and much above the average of photographic productions; the work of M. Raps was likewise good, and worthy of mention. Other specimens shown were of mediocre quality, although it should be mentioned that the prices asked were in every case very reasonable.

At Coblenz the specimens shown were on a par with those at Cologne, but the number of photographers is not nearly so great. At Neuwied, a small town north of Coblenz, M. Koch does some very good work, especially in cartes; his grouping and posing, particularly of female figures, is remarkably natural and effective, while the photography itself is of first-rate order.

In reference to the question of retouching, a subject at present commanding much attention, I may say that throughout Germany I noticed that in the majority of instances the photographs were freely retouched. In many cases, and by first-rate artists, this retouching appeared to have been done direct upon the negative, a method much more effective and even in its results than that of manipulating the paper positive. Each photographer has his own particular way of modifying the negative, which is worked over to a more or less extent, according to the artist's taste, and he is in general very loath to divulge his mode of manipulation.

THE PHOTOGRAPHER'S FUTURE.

SIR,—"Make hay while the sun shines!" was an old adage at one time; but, instead of hay, photographers usually make pictures—at least, so they call them.

Now, did it ever occur to the ingenious minds of your numerous readers that the above adage had an intimate companion: "Look out for a rainy day"? And if it ever did strike their imagination, I fear it was unheeded. What provision have they made for the wet, or rather "old age," when cyanide has secretly undermined the constitution, when disasters occur?

You photographers are like the butterfly race—all life for a season, all show and display. Yet think for a moment: even in the midst of your career misfortune may overtake you, not waiting until the time your frivolous life has had its

natural run, but nip you up in the midst of all your glorious excess, as a frost does your insect similar.

I will own that a woman has but a poor, weakly voice to rouse men from the deep lethargy into which they have fallen concerning a topic so essential to all well-meaning, intelligent classes. To enforce my views, permit me to call attention to the societies which have been formed by different sections of our busy fellow-creatures, and for a moment consider the vast amount of real good and benefit they have done. The fish-mongers, for example, by their pretty almshouses, and amount of pensions received, show how the many may help the few. Let me not be misunderstood. I do not imagine photographers have only to say the word, and it can be done without a struggle, or the work completed without trouble and patience, but they could strive to imitate, and even excel. Everything must have a beginning, and, however small at the commencement, may one day stand proudly forth and speak volumes in praise of its founders; and even should success not attend their labours, it will not be the first time in their lives that photographers have failed, and often in less creditable objects.

Would to goodness men who have striven and worked so nobly for the art, fearing nothing of contradiction and shameful abuse, asserting that which they think of benefit to their fellow-workers—would to goodness, I say, they could be brought to interest themselves in behalf of the widows and children of those belonging to their profession. In this matter I would ask them to leave aside all dissension which is so often indulged in at their scientific meetings, for unity is strength. Who knows but what those who exert themselves now may, in some future time, be glad of the provision made, though they may little imagine such a coming change; but they must not forget that fortune is a fickle jade.

Let me, before closing this appeal, mention that I have searched the columns of your valuable paper in the hope of finding some one who would bring this subject into consideration, but not finding any one, I, a woman, have ventured to plead for my sex in this instance, and have actually the audacity to solicit your favour and support.

In conclusion, allow me to add that although at present I am not in need of aid or support (except your own in inserting this), yet misfortune may overtake the strongest of us, and I cannot help feeling something ought to be done. Trusting you will pardon my trespassing so long on your valuable space, I remain, yours, &c.,

HOPEFUL.

September 1st, 1868.

[Our fair correspondent may be sure of our sympathy and aid in such a project. Five years ago we mooted such a question, and on page 589 of our Seventh Volume she will find the first article which appeared on this subject. In the next and subsequent volumes many articles have appeared, urging the same idea. It requires a little band of workers to initiate such a scheme: men who are indifferent to the abuse of malignant persons who will impugn their motives and calumniate them for their best efforts.—ED.]

SPONGING WAXED PRINTS.

SIR,—It is perhaps worth while to set many well-meaning, and some ill-meaning, persons right on the action of an encaustic paste in protecting the water colour used in retouching albuminized prints from the action of moisture. I have recently had a curious experience in this matter. Having retouched some prints with that valuable pigment, charcoal grey, mixed with a little gum, I was startled to find that no subsequent application of wax or encaustic paste served to give the retouched spots a glazed surface like the rest. Do what I would, they remained obstinately dead or flat, giving the print a very unpleasant effect. It occurred to me to try to remove them, and on applying a sponge filled with water, notwithstanding that a very thick coat of wax had been applied, the whole of the colour was easily removed. I have repeated this operation since on waxed prints in which spots had been touched out with other pigments and gum, and in all cases I find that sponging will remove the colour. I do not pretend to enter into explanations as to the cause, but any one can test and prove the result. It seems probable that the thin coating of wax is easily disturbed by a little friction, and that the water, being quickly absorbed by the gum or pigment, causes it to be easily removed.—Yours truly,

R.

Talk in the Studio.

RECTIFYING ALCOHOL BY MEANS OF GELATINE.—Whilst witnessing the manipulations of the Eburneum process in the studio of Mr. Burgess, at Norwich, Mr. Burgess mentioned a curious circumstance. When the gelatine and pigment forming the layer of eburneum is quite dry, it is coated with collodion to render it impervious to moisture. This operation he noticed always rendered the eburneum soft and limp, so that it required placing in the drying-box again. The greediness of the gelatine for moisture causes it to absorb the trace of water in the solvents of the collodion, and so become damp. This suggested to us a possible use for rectifying small quantities of alcohol, or removing water from collodion in which the use of imperfectly-rectified solvents has caused a tendency to give crapy films. Place a little pure gelatine in the spirit to be rectified. There is no danger of any portion of it dissolving, but it will absorb the water and gradually swell; it may then be removed, carrying the water with it. This will be found more convenient than the plan sometimes recommended of agitating with carbonate of potash, and after subsidence decanting.

PORTRAITS OF M. ADAM-SALOMON.—We have just received proofs of the portraits taken by Messrs. Robinson and Cherrill of M. Adam-Salomon, one 16 by 12, and two 12 by 10 inches in size. We have never had the good fortune to meet with anything in photographic portraiture to surpass the examples before us, very rarely with anything to approach them in photographic perfectness and art excellence. The treatment is similar to that generally adopted by M. Salomon himself, distinguished by singular luminousness and force, and not less marked by delicacy, modelling, and fulness of gradation from pearly-white to rich, deep, velvety, transparent blacks. The portraiture in each is exceedingly good; but one in which the model is nearly in profile, sitting with folded arms, and acute but meditative expression, is a portrait possessing rare embodiment of character as well as technical perfectness, giving a grandeur to the head not often seen in photography. We hope that Messrs. Robinson and Cherrill may be induced to publish this portrait, which, as an example of art photography, as well as for the interest of the subject, many persons would be glad to possess.

NATURAL ACCESSORIES.—Our occasional contributor, "A Practical Man," referring to our mention of natural, rustic, and other accessories in the studio of Mr. Burgess, calls attention to his prior suggestion of their use in various articles in the early volumes of the NEWS. No question of priority, however, arises in the matter. Such accessories have been used by some persons as early almost as the introduction of photography as an art.

CABINET PORTRAITS WITH NATURAL BACKGROUNDS. We have received from Mr. Durrant, of Torquay, some examples of cabinet portraiture—groups and single figures—with characteristic natural backgrounds of far more than average excellence. The photography is perfect—at once rich, forcible, and delicate—and the art qualities are of a high order. Some of the groups are engaged in fishing, and both foreground objects and the distant landscape are in admirable keeping with the occupation. Other natural accessories and scenery are alike pleasing and characteristic, and manifest a fine feeling for pictorial effect. Mr. Durrant is a young photographer, and, if we are not mistaken, a pupil of Mr. H. P. Robinson, to whose tuition he does much credit. His early efforts give promise of a high position amongst those who endeavour to use photography as a fine art.

To Correspondents.

A. H.—Your toning bath containing $7\frac{1}{2}$ grains of chloride of gold ought to tone about from twelve to twenty sheets of paper. It has doubtless become inactive, either from some impurity in the materials used, or from some contamination. Some samples of acetate of soda are impure, carbonate of soda being present, and a toning bath made with such a sample would soon become inert. If, in the process of toning, you touch the solution with fingers which have been in contact with hypo, the bath will quickly lose its toning qualities. As a beginner, you will do wisely not to make so large a quantity of toning bath at once, without ascertaining by experiment that the materials are pure. You can now add protosulphate of iron to the solution, which will throw down the gold as a black powder, and this may be reconverted into chloride of gold by means of aqua-regia. 2. The "want of clearness in the transparent parts" is the result of fog. It may arise from a variety of causes. Try adding a little more acid to your developer.

Test your bath, and if it is not acid, add a drop or two of nitric acid. As a general rule, acid is the great preventive of fog. Read an article on the Causes of Fogging, by Mr. Hughes, which appeared in our pages a few weeks ago. 3. A very simple and efficient toning bath consists of 1 grain of chloride of gold, 1 grain of carbonate of lime, and 6 ounces of water. This should be made twenty-four hours before it is used. 4. There is no especial collodion made for copying prints; but almost any sample which is ripe, that is sufficiently old, will answer.

ARTHUR WINTERTON sends us an interesting print from a negative taken from one of the set pieces in a display of fireworks. The design is brilliantly and perfectly made out, the artificial light having been sufficient to impress the sensitive plate and produce a negative in an exposure of eight seconds. The result is very good and novel.

J. C. S.—We have tried the collodion, which, in our hands, worked well and without any abnormal characteristics, the only peculiarity being some slight symptoms of over-iodizing. We suspect that you had tried it in a somewhat weak bath, in which case, the collodion being very fully iodized, a superficial layer of iodide of silver would be formed, which easily breaks up and is washed away.

YOUNG.—If Marion and Co. are not prepared yet to supply their transparent pellicle, we do not know of any one else who is. Mr. Woodbury has not anything of the kind ready for the market. You can easily make such a pellicle for your own purpose. Coat a plate of glass with a thick collodion containing 10 per cent. of castor oil; when dry, coat it with dilute albumen, then coat with sensitive collodion, and proceed to produce your positives in the usual way, and finish as may be required. Then remove the whole from the glass. If a suitable tough collodion have been used for the basis, this will be easily done.

YOUNGSTER.—Zinc would not be suitable for a waste trough or sink in the dark room, as it would readily corrode; varnished wood will answer better.

T. M. (Manchester).—There is no work published on photo-lithography. The fullest details which have been published will be found in Lieut. Waterhouse's recent articles on the subject in our pages. An excellent article was contributed by Mr. Butter to our YEAR-BOOK for 1867.

A. X., who recently inquired of us where microscopic photographs can be obtained in this country, is informed that Mr. J. Beard, of Old Bond Street, Bath, can supply him.

20, KENT ROAD.—Various materials have been recommended for retouching negatives; but it is difficult to find anything but water colour suitable, if you wish to remove it at will. Old negative films ground up with turpentine and strained through muslin have been recommended; blacklead ground up with turpentine in the same way has been recommended by some, and we have heard very good accounts of the material recommended by Mr. Bell. See an article by Dr. Reissig in the present number.

C. E. F.—In order to add gelatine to a developer you must add it first to the water, and dissolve by heat. In the small proportion necessary after it has once been dissolved by heat, it will remain in solution. One grain in a pint of a developer will often prove sufficient. Gelatine is never dissolved by cold water if it be of good quality. If you wish to add some to a developer in existence, make a solution in hot water, and then add a little to your developer.

W. J. A. G.—We have not had sufficient experience with the plates in question to form an opinion. We have occasionally used them, and have not found them blister. Try moistening with a mixture of alcohol and water.

E. JENNINGS.—Mr. H. C. Jennings first sent a letter to the First Volume of the PHOTOGRAPHIC NEWS, and has continued to send us occasional letters at intervals since. The first was, we believe, in the number for January 7th, 1859. The volume is out of print, but copies can occasionally be obtained.

MR. MAYCOCK.—We can scarcely undertake to say which is the most portable tent in the market. Blanchard's, sold by C. E. Elliott, is very portable; so is Meagher's; so is Roueh's. Thomas's is exceedingly complete, but it is not intended to be carried by one person. Murray and Heath's is similar. We do not remember their respective prices. A bromide does not produce crappiness in collodion. Crappiness is generally due to excess of water in the solvents.

J. W.—You will find a good process of printing on muslin and similar fabrics on p. 98 of our last YEAR-BOOK.

F. W.—We have not seen the work issued by Virtue and Co.; but such of Caldesi's photographs of the pictures in the National Gallery as we have seen are very excellent. The mode of copying them employed was, we believe, first to secure a good facsimile in charcoal by a clever artist, and from this monochrome copy a negative was obtained. 2. The reduction of the image in the hypo bath is due to various causes. Sometimes it is due to the original preparation of the paper, excess of chloride being used. It is more frequently due to the action of the toning bath, which, if used new and containing much free chlorine, converts part of the image into chloride of silver, and this is dissolved by the hyposulphite solution.

Several Articles in type are again compelled to stand over until our next. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 523.—September 11, 1868.

CONTENTS.

	PAGE
Encaustic Pastes: M. Adam Salomon's Formula.....	433
Uranium and Nickel Printing Process.....	434
Echoes of the Month. By an Old Photographer.....	434
Foreign Miscellanea.....	436
Method of Obtaining Intense Negatives.....	436
Practical Hints in Operating. By Fritz Haugk.....	436
Pictorial Effect in Photography. By H. P. Robinson.....	437
On the Employment of Blue Glass in Photographic Studios. By M. Alois Nigg.....	469
See Clement.....	439

	PAGE
Phosphorescent Photographs.....	440
Communications on Photography. By M. Carey Lea.....	441
On the Preparation of Iodic Acid and Iodate of Potassium. By Professor J. S. Stas.....	441
Con-Elliptical Vignette. By Professor Towler, M.D.....	442
On Pure White Gutta-Percha.....	442
Talk in the Studio.....	443
To Correspondents.....	443
Photographs Registered.....	444

ENCAUSTIC PASTES.—M. ADAM-SALOMON'S FORMULA.

THE value of an encaustic paste in improving the effect of photographic prints is becoming very generally recognized amongst photographers. A good encaustic confers three special benefits on the print; it gives depth, richness, and transparency to the deep shadows; it renders apparent delicate detail in the lights which would otherwise remain imperceptible; and it aids in protecting the surface, and so tends to permanency.

The first and last of these three advantages are generally appreciated, but it is not so well known—or, at least, we believe that it has not been so specially noted—that the application of a wax or of an encaustic preparation practically brings out minute detail not before apparent. But on careful observation it will be found that this is so. A familiar and palpable illustration of the kind of effect produced is furnished by the process of varnishing or French polishing a piece of fine-grained wood. When its surface is rough the character of its grain is scarcely perceptible, but is rendered partially visible by planing, scraping, or rubbing smooth. However perfectly smooth it may be made, however, much of the most delicate part of the grain remains invisible until it is polished or varnished, giving it a slightly diaphanous surface. So it is with the photographic print. Photographers know that when it is rolled, and so made smooth, the definition and detail look finer than they did before. But the effect of an encaustic paste is to make detail bear out which was not seen before. The delicate pearly gradations which surround the high lights, which were buried in the texture of the paper, are, when the surface is made diaphanous, perfectly visible, and the bringing out of such gradation has the effect of giving a singularly delicate quality of modelling, and a rare brilliancy in the lighter portions of the picture. We have heard it remarked of some photographs finished in this way, that the faces have the appearance of being modelled in white marble. This is scarcely true or good criticism, by the way, for flesh should not look like marble. But the idea has been suggested by the diaphanous surface rendering visible a great deal of very delicate detail which gave an effect of roundness and modelling without the aid of deep shadows, an effect very similar to that of a white marble statue, in which the diaphanous surface shows every dimple, and undulation, and gradation, which would be lost in a coarser or more perfectly opaque substance.

Various formulæ for the preparation of encaustic pastes have been published, and many of them very excellent. The qualities required are, easiness of application and the capacity of giving richness and depth without too much gloss, and of yielding a hard, firm, permanent surface. The exceedingly fine surface and the great richness in the

shadows of the pictures of M. Adam-Salomon naturally renders it a matter of interest to learn the especial formula of the preparation he employs in finishing his prints. On his recent visit to London, in answer to inquiry, he gave us, from memory, the recipe, stating a doubt as to its exactness, and promising to send us the precise details of an improved formula on his return. Experimenting with the formula he left us, we produced, by a very slight modification, an encaustic paste of exceeding excellence, which gave us admirably satisfactory results. It stands as follows:—

Pure white wax	5 drachms
Gum elemi	1 drachm
Turpentine	2 drachms
Essential oil of lavender... ..	1 drachm
Essential oil of spike	1 drachm.

The wax is cut into shreds, and melted in a capsule over a water bath. Placing it in a jar, and the latter in a pan of hot water, will serve. Powder the elemi, and dissolve it in the turpentine and essential oils, using gentle heat. Some samples of elemi are soft and tough, and will not admit of powdering, in which case it may be roughly divided into small portions and placed in a bottle with the solvents. Elemi is generally a tough gum, of a mottled-looking, mixed character, containing a good deal of impurity. It will invariably need straining through muslin to remove impurities and insoluble matter. The clear solution is then added to the melted wax, and well stirred. It is then poured into a wide-mouthed bottle and suffered to cool. It forms a firm paste, very easy to apply, and yielding a fine, hard, rich surface.

To Messrs. Robinson and Cherrill, M. Salomon stated the materials without proportions. They have favoured us with an example of a formula worked out by experiment, and with some prints treated with it. Mr. Robinson writes to the effect that the trouble they had experienced in getting good results with encaustic pastes on large pictures had induced them to give up its use; but that all difficulties seem to be removed by the preparation the formula of which we subjoin:—

Pure white wax	2½ ounces
Gum elemi	1 ounce
Turpentine, about	5 ounces
Oil of spike	1 ounce.

Mix as above, and then add 1 drachm of essence of lavender. This paste is much thinner than that made by the formula preceding it, and Messrs. Robinson and Cherrill prefer it on that account. It has the disadvantage, however, in some cases, where the surface of the paper is soft and absorbent, that it permeates the whites, and leaves a slight discolouration like grease, which is very slow to disappear, notwithstanding that the solvents are volatile.

Within the last few days we have received the improved

FORMULA OF M. ADAM-SALOMON.

It stands as follows:—

Pure virgin wax	...	...	500 grammes
Gum elemi	...	...	10 "
Benzole	...	...	200 "
Essence of lavender	...	...	300 "
Oil of spike	...	...	15 "

Those who wish to try a small sample can substitute grains for grammes. Melt the whole on a water bath, mix thoroughly, and strain through muslin. A simpler plan will be to dissolve the elemi in the solvents, as described above, and, after filtering, mix with the melted wax, as the filtration, which is chiefly intended for the gum elemi, is more easily managed before the wax is present. This, when finished, forms a stiff paste, not differing much in quality from that produced by the formula we have first given; but better, we think, in the fact that it dispenses with turpentine, which we regard as an advantage. In each case it will be seen that, as in all such preparations, wax is of course the principal ingredient; but the gum elemi serves to give firmness, toughness, and hardness to the surface obtained by its application.

The encaustic paste is put on the print in patches in three or four parts, and then rubbed with a light, quick motion, with a piece of clean flannel, until a firm, fine surface is obtained. If a rich thick coating of the encaustic be desired, a very light pressure in rubbing is necessary, so that a polish may be acquired without rubbing off the paste in the operation. If a print be retouched, more especial care is required to use a light hand in applying the encaustic paste.

We add to these formulæ for preparations for finishing positives one which M. Biennert gives in the *Archiv*, which, despite the curious mixture it seems, is said to give good results:—

White wax	...	...	11 grammes
Ether	...	...	32 "
Plain collodion	...	...	24 "
White shellac varnish	...	...	16 "
Alcohol	...	...	8 "

This is to be applied with a pledget of cotton wool, rubbing rapidly until a polish is acquired.

URANIUM AND NICKEL PRINTING PROCESS.

SINCE the publication of our last, we have heard of another economical printing process possessing much promise. A few weeks ago we received from Dr. Liesegang, amongst some other novelties, a very fine albuminized print, at once soft and brilliant, with the simple inscription at the back running thus,—"Albumen, nitrate uranium, nitrate nickel." On inquiry as to the mode of using the materials mentioned, and whether they are the only agents used in producing the process, we learn that the print is produced by a process suggested by Dr. Liesegang three years ago, and which, it seems, Herr Wothly has recently been working out with some success.

So far as we can learn at present from the details kindly furnished by Dr. Liesegang in a private letter, as in the process upon which we have recently experimented, described in our last, silver is the colourific agent of which the print is formed, but uranium and nickel play an important part in the process. The solution contains nitrate of uranium, nitrate of nickel, and a very small portion of nitrate of silver. Albuminized paper, without any chloride, is floated on this bath, which is sufficiently charged with ether and alcohol to prevent solution of the albumen, notwithstanding the small quantity of the silver salt present. The especial part played by nitrate of nickel in this pro-

cess appears to be that of an accelerator, and, like most accelerators, it also tends to produce softness, excess producing weakness. The greatest advantage of the process is obtained when the paper is exposed wet from the solution. This can only be done, of course, in solar camera printing, but for this purpose it is found very valuable. Dr. Liesegang has tried keeping the paper moist by means of steam during the progress of printing, and has found that the exposure was reduced one-half by such treatment.

The precise formulæ and details of this process have not yet reached us, but are promised shortly, when we shall lay them before our readers. Any printing process which minimises the use of silver possesses a two-fold advantage—first, economy; and, second, greater probability of permanency. The last claim may require explanation, which will, however, be readily understood. It is this: the smaller the proportion of a silver salt in the paper, the less the proportion of any fixing agent necessary to remove the unchanged salt; and the less fixing a print requires, the less risk there is of forming unstable compounds in the fixing bath, and the less trouble there is in removing from the print traces of the fixing agent, which, if left in, endangers its permanency.

ECHOES OF THE MONTH.*

BY AN OLD PHOTOGRAPHER.

DISCOVERIES, PRINTING PROCESSES, AND PATENTS—DRY PROCESSES—BRITISH ASSOCIATION MEETING—SALE OF POISSON'S BILL—AMERICAN BROMIDE PATENT—SCHONBEIN—MR. FRUWIRTH'S PROCESS.

RECLINING lazily under the cool shelter of a rock, listening to the wondrous philosophy murmured out by the sad sea waves, I have been led to speculate on the curious fact that invention or discovery in connection with photography seems to flow in tidal waves, one pressing rapidly upon another for a time, to be followed by a period of "slack-water." At one time the tide of invention sets in with printing processes, and a flood of new and valuable methods of producing fine prints from the negative overwhelms photographers, who, perhaps, embarrassed by the wealth of choice, neglect to work out any of the new methods proposed for their advantage. In 1864 we had Swan's carbon process, the Wothlytype process, and your own collodio-chloride process. The carbon process, being undoubtedly the most important of these, has been steadily making its way, and must, in the end, be the prevalent, if not the only, mode of printing photographs. The Wothlytype process, as I have always believed, deserved more attention than it received, but it was unfortunate, both in the time and in the manner of its introduction, and there were uncertainties and vagaries in the action of the materials employed which were never well understood or explained. The collodio-chloride also suffered by forming one of a crowd of printing processes, having to divide the attention of the photographic public with the new uranium and carbon processes. But it suffered most from being a free gift to the public, and having become everybody's property, it became nobody's business. If it had passed into the hands of some individual or firm whose interest it would have been to work out its applications, to prepare and supply suitable materials, and feel a special interest in its commercial success, I am satisfied that its adoption would have been more general, and the interests of photographers and of proprietors more perfectly served. Monopoly of some kind seems to be necessary to repay inventors, or they have little stimulus to exertion. The Leptographic Company, who have appropriated your collodio-chloride process, endeavour to protect themselves by affecting secrecy as to the exact mode of application. But surely the Patent system is better than secrecy? By the latter, knowledge is buried; by the former it is published,

* The "Old Photographer's" copy did not arrive in time for insertion in our last.—ED.

but its originator has secured the profits of such knowledge for a few years. Without the certainty of the possession of these profits it would often be impossible to work out inventions.

This is an aspect of the Patent question too often overlooked. Take two especial examples: the carbon process and the photo-relief process. Unless Mr. Swan had possessed an absolute property for a time in his labours he could never have worked out the carbon process to the degree of perfection it at present possesses; and without the constant experiment and persevering labours of a capable person, who must be in a position to spend much time, much money, and much brain-power on the work, it would never have attained the practical and perfect character it now holds. So with the photo-relief process. The discovery made by two gentlemen, independently, of the original principle of printing in semi-transparent ink from intaglios, in which shadow was represented by variation of depth in the recesses, was valuable enough; but the working-out of that principle has involved an amount of labour and cost which would have been literally impossible to a person without an absolute property in the results. Every piece of apparatus, every material employed, has involved some novelty, and has required its conditions of success to be determined by costly and protracted experiment. And if these labours had not presented a prospect of eventual commercial success, it is more than probable that the process would have been relegated to the limbo of ingenious possibilities.

My speculations by the sea-side, however, referred to dry plates; but having referred to printing processes as an illustration of the tidal character of invention, these reflections on one phase of Patent law, which have often passed through my mind, found a chance of expression which I had not the energy to resist. Last year we had a high tide of dry processes: England's collodio-albumen process, the morphine process, the coffee process, the gum process, and some others. This summer there has not been a single new process proposed, and only one or two slight modifications of existing methods, a circumstance which, having in view the number of excellent processes already in existence, I regard as a matter for congratulation, as it affords time, without the distraction of new suggestions, to appropriate, work out, and master properly the novelties of last year. I have had but little time or energy as yet for this work, but I have done a little. The morphine process, with its delightful simplicity, I find I can only rely on within a few days after the plates are prepared. I have found them good at the end of three weeks, but I cannot rely upon a repetition of the experiment, having found them both insensitive and inclined to fog at the end of a week. England's process I find capital. The plates keep two or three weeks, and the negatives are very satisfactory. Nothing, however, exceeds in my experience the coffee process; it is simple and certain, less sensitive than morphine plates, but not slow. The plates keep well, and the negatives are excellent. Gum I have not yet tried; but from the negatives I have seen, and the accounts I have seen, it certainly seems to be the *ne plus ultra* of dry processes.

The British Association meetings at Norwich scarcely seem to have been very successful, judging from what has appeared in the reports, and from the private account of a friend. With the exception of some portion of Dr. Phipson's paper, and Mr. Bing's paper on "Actinometry," no matter of special photographic interest seems to have been brought before the sections. Professor Morren's description of a new action of light on chloride of silver seems to contain nothing which Mr. Spiller's papers on the same subject, published years ago, did not contain. I understand that the innkeepers of the ancient town distinguished themselves by fleecing members to a serious extent; and it was reported that at the entertainment or fete given by Mr. Harvey to the members of the Association, eighty pounds' worth of silver plate was stolen. As, however the company included—

surreptitiously, I am told—many hundreds of persons not in any way connected with the Association, and of a class clearly not accustomed to "sit at good men's feasts," the philosophers can scarcely be held accountable for the loss.

The new Pharmacy Act, doubtless well intended, will be the source of some annoyance to dealers in photographic materials, or such of them as are not at the same time pharmaceutical chemists. The more stringent the conditions under which the sale of poisons is permitted, the more restricted, of course, will become the chances of accidental poisoning. Suicide will not be much affected by a difficulty of procuring poison—seeing that the avenues from life are so numerous—except in so far as ready facilities sometimes create temptation. King John exclaims,—

"How oft the sight of means to do ill deeds
Make ill deeds done!"

But if the precautions now made binding upon the pharmaceutical chemist had been made binding upon all who had occasion to vend poisons in the regular transaction of their business, surely the end would have been gained. If I send up to the dealer in London who supplies me with all my photographic requisites, for a case of goods, surely it is hard that he cannot send me a bottle of chloroform varnish, or a little cyanide or bichloride of mercury, articles necessary in my studio for occasional use, although abandoned in my general practice. It is an ill wind, however, that blows nobody good. I suspect that the dealers who are also chemists will frequently gain by this arrangement; for if it be absolutely necessary to send to them for a few things, it will often be found convenient to order other things at the same time. Your advice to lay in stocks of the prohibited articles is good in two ways: it will, if carried out, clear out the stock in the dealers' hands, and rid them of a difficulty, and will save, possibly, some little trouble to the consumer in getting a further supply.

All photographers of cosmopolitan spirit must congratulate their brethren of the United States on their emancipation from the iniquitous bromide patent, which was not only a tax upon their pockets, but a perpetual outrage upon their common sense. Intelligent American photographers who had for a score of years past used bromine in photographic processes, and who would so naturally employ a bromide in the collodion process in their earliest experiments with it, just as we did in this country, must have felt themselves terribly outraged in having to pay a constant tax for permission to use bromine because some one contrived to secure a patent for its use in 1854, three or four years after its use in collodion was known in this country, and fourteen years after its use in equivalent processes was common throughout the world.

I notice the death of Schonbein is just announced, in his 69th year. He little thought when he discovered gun-cotton that it would form the basis of such a revolution of the photographic art as it has proved! Photographers owe him a tribute of grateful remembrance for rendering so much possible in their art—so much already accomplished—so much to be accomplished by the collodion process.

I am glad to recognize in the examples of Mr. Fruwirth's process I have seen, indications of unusual excellence in a phototype process. One of the difficulties which such processes have to encounter is the necessity of having to reproduce subjects in mechanical gradation. To do this they must reproduce engravings which have been already published, or original drawings expressly produced for the purpose. The temptation to do something original often makes the inventor choose the latter, and it so rarely happens that capable draughtsmen are obtained to prepare the original drawings. Hard, scratchy, ill-drawn things in conception, and execution of the feeblest kind, are too often produced; and the conclusion which follows is, however unreasonably attained, that the process is unsatisfactory. It is to be hoped that Mr. Fruwirth will avoid splitting upon this rock.

The societies have only met in the fields, and then less for photography than for social enjoyment. In another month many of them will commence the winter session, and then discuss, it is to be hoped, the materials won during a summer's campaign.

Foreign Miscellanea.

In the *Bulletin de la Société Française* is an account of the method of photo-engraving recently patented by M. Henri Avet, a colonel on the staff of the Italian army. The process consists in pouring upon the collodionized side of a negative a sensitive mixture—as, for instance, gelatine and bichromate—and exposing the layer, when dry, to the light under the negative. The gelatine is then washed in the dark, and a relief is thus formed, adhering to the negative, from which a metallic fac-simile may be obtained by the electrotype process, or, if preferred, an impression from the relief may first be obtained in wax, and this afterwards electrotyped. A very deep relief may be produced by repeating the process of coating the negative with gelatine, and exposing it. A mould of this kind is proposed by the inventor for stamping porcelains and other transparent materials, while the less deep metallic intaglios are for printing reproductions of engravings, drawings, maps, &c. If an artificial grain is necessary for printing a picture, the inventor produces the same by exposing his negative first of all in front of a black cloth screen covered with white net lace, and afterwards at the object to reproduce, or *vice versa*, the fine markings not prejudicing the image upon the plate in any way. The same effect may be produced by placing two negatives together—one having an object depicted on its surface, while the other has the fine lines—and producing a gelatine relief from both at the same time.

Dr. Krippendorf, of Aarau, describes in the *Photographisches Archiv* his method of operating out of doors. As a tent he uses his tripod camera-stand, the legs of which are but twelve decimetres in length. By enveloping the stand in a large black cloth cover made for the purpose, and using as a resting-place a small foot-stool, he is enabled to conduct his operations with ease and comfort, the space afforded being amply sufficient for his wants. A vessel of water placed a slight elevation above the tent, and fitted with a flexible tube, supplies the means of washing, and a small aperture cut into the side of the black cover and fitted with yellow calico provides for light and ventilation. Care must be taken that one of the three legs is facing the direction in which the camera is pointed, so that the whole affair may be as rigid as possible.

A photographer in Freiberg is making seals upon which photographic portraits are engraved. He exposes a film of bichromated gelatine under a glass positive, and then places the same in water. The film swells out in parts, and a picture in relief is thus obtained, from which an impression is taken in plaster of Paris, a metal cast of the latter being afterwards produced by the electrotype process. The seals thus obtained are sold at the rate of six shillings each.

M. Sigwart, of Elberfeld, in making a few remarks upon the carbon process, recommends the employment of a solution of gutta-percha in chloroform instead of the india-rubber solution generally employed. He states that the gutta-percha may be applied with the same facility, and possesses the advantage of drying within a few minutes after its application, forming a film of the most adherent character, which clings with especial tenacity to india-rubber paper. M. Sigwart states that he has experimented with several kinds of carbon material, and affirms that he obtains the same result on a sheet of American paper in five minutes as that produced upon Swan's material in fifteen minutes; at the same time, for the development of pictures on the American paper, a lengthened manipulation was necessary in water of 70° to 80° C., while the English paper developed

much more easily, and required treatment with luke-warm water only.

General Count Nostitz, of St. Petersburg, communicates to the *Archiv* the satisfaction he has found in using dry plates prepared by Mr. Gordon's gum process. So sensitive has he found them that he has been able to secure instantaneous negatives by their aid, the exposure required being about one-third longer than that necessary for wet plates. They remained in good order for months, and might be kept for some time after having been exposed, without being found to suffer. As a modification to the process, the Count approves the employment of an iron developer instead of the alkaline treatment formerly used by Mr. Gordon. The exposed plate is first moistened with distilled water, and then the developer, to which a trace of silver solution is added, is poured on; a few more drops of silver solution may afterwards be supplemented. If by this means sufficient density is not obtained, the plate is carefully washed, and intensified with 1 gramme of pyrogallie acid, 1 gramme of citric acid, and 240 grammes of water to which a few drops of silver solution are added immediately before employment.

METHOD OF OBTAINING INTENSE NEGATIVES.

A CORRESPONDENT sends us the following in the form of a printed slip, which has apparently been supplied by some "process vendor." We may remark that it is very similar to the method which Col. Stuart Wortley used to employ in intensifying the very thin images he obtained in his instantaneous process. If this method be employed upon a negative already possessing some degree of vigour there is a risk of over-intensifying. For reproductions, or any subject requiring great density, this process answers well:—

"The novelty of this process consists in applying the pyro and silver last, instead of the usual way, which is before the fixing. Greater intensity is obtained without injury to the half-tones if the process is conducted with care and taste. With views the chemicals should be poured upon the skies, and worked principally upon that part to avoid chalking the lights and half-tones.

"The negative, after being developed with iron, fixed with cyanide, and washed, is, while wet, flooded with bichloride of mercury, 10 grains to the ounce of water; well washed, and again flooded with iodide of potassium, 3 grains to an ounce of water; again washed; then with pyrogallie 2 or 3 grains, acetic acid 5 drops, water 1 ounce, commence the intensifying by first pouring on the pyro alone to equalize the flow, then with the addition of 3 or 4 drops of nitrate of silver 5 or 10 grains, water 1 ounce, pour on and off four or five times, watching the picture carefully as it increases in depth; wash well the instant sufficient intensity is obtained. If the picture does not come up to the mark after a few applications of the pyro, do not continue its use, but wash it well and commence again with the bichloride and iodide, or iodide alone, taking care to wash well as at first; this will probably complete the picture; if it does not, pyro and silver must be applied again, increasing the proportion of silver. Should a brown stain occur in the deep shadows, it can be removed when the intensifying is finished by pouring the bichloride on and off until it changes to an opalescent hue, which will be no impediment to the printing. The operations are to be carried on in open daylight."

PRACTICAL HINTS IN OPERATING.

BY FRITZ HAUGK.*

I.—SALTPETRE IN NITRATE OF SILVER.

Some time since, while engaged in operating, I found that one of my negatives had been so vigorously acted upon by the fixing solution that no vestige of a photographic image remained upon its surface, and nothing was visible but a

* *Photographisches Archiv.*

transparent film. According to Hardwich, a result of this description is caused by a collodion compounded of pyroxyline which has been prepared with acids of insufficient strength, the product formed being incapable of furnishing a film of the required hardness; moreover, in such a collodion the iodide of silver is stated to be formed more upon the surface of the film than actually inside the same. In the present case I was convinced of the faultless composition of the collodion, and it was necessary, therefore, to seek the cause of failure elsewhere.

My suspicion at once fell upon the nitrate of silver which had been used for compounding the sensitizing bath. It had been freshly made up on the day of its employment, and experiment which I hereupon instituted with the nitrate of silver in question at once proved the same to contain an appreciable quantity of saltpetre. The bath was on this account, therefore, comparatively weak, a circumstance which rendered the cause of failure evident, for after the solution had been evaporated to two-thirds its original bulk, the fixing agent ceased to exert any deteriorating effect upon the negative.

According to my knowledge, I believe no one has yet pointed out this particular source of failure, and as in my early days of photography a similar instance came under my notice, I think it but right to make known the same for the benefit of my less experienced colleagues.

Generally speaking, it is by no means so rare a circumstance to receive nitrate of silver adulterated with saltpetre as one is apt to suppose, and every photographer who does not draw his supply direct from firms of well-known reputation should make it his business to ascertain the purity of the article delivered to him, if only for the purpose of estimating its value. To do this a small quantity of the nitrate is dissolved in a little distilled water, and so much chemically-pure hydrochloric acid added, drop by drop, until no more chloride of silver is formed. The clear liquid is then filtered off into a dial glass and evaporated by a gentle heat. Does the nitrate of silver contain saltpetre, there remains, after the liquid has completely evaporated, a network of crystals upon the surface of the dial-glass; if no saltpetre is present, no deposit of any kind will be perceptible.

That failures from the cause in question are of seldom occurrence is accounted for by the fact that sensitizing baths are generally prepared in the proportion of one to ten, and possess, therefore, a concentration which conceals the presence of saltpetre; if, however, a bath in the proportion of one to sixteen is prepared, it will be found that, out of an average of twelve samples of so-called chemically-pure nitrate of silver, at least two will betray the presence of saltpetre, and yield results similar to the one I have described.

II.—THE INTENSIFYING OF NEGATIVES.

Many of my colleagues, when making professional tours, practise the custom of simply developing their plates at the moment of their production, and postpone the operations of intensifying and fixing until they have more leisure to devote to the purpose. I myself have also practised this method of operating, but have always remarked that the film of precipitated silver formed upon negatives produced in this manner is of a much coarser description than in those which are perfectly white in a moist condition. From such coarse-grained plates as these it is, of course, impossible to obtain delicate prints, and I would therefore recommend that, whenever practicable, the process of intensifying should immediately succeed that of developing. When this is impossible the negatives should not be allowed to become dry, but should be kept moist by constant pouring over of water.

III.—TEARING OF THE COLLODION FILM IN VARNISHING.

Now and then the question arises as to the cause of injury sometimes inflicted by the varnish upon the film, and as the subject has again been discussed very recently, I here make known my own experience in the matter. It is usual to

ascribe the evil to the too-concentrated condition of the alcohol used in the manufacture of the varnish, and this is, no doubt, in most cases, the case; but even with the employment of a dilute alcohol the unpleasant result may be brought about; when, namely, the plate is rendered too hot previously to its being varnished. Everything depends, however, upon the description of collodion used, for with some kinds I have purposely overheated the plate to a considerable extent, and the latter has sustained no injury, while with negatives prepared with other materials a slight excess of temperature was sufficient to bring about their destruction.

IV.—STAINS AND STREAKS.

Inexperienced photographers are greatly troubled with these evils, the majority of which are due to the manner of pouring on the developer. Even with skilful treatment of the developing solution, however, strains are sometimes unavoidable; for instance, when the different photographic compounds have not been carefully prepared. The silver bath may have been made too strong in comparison with the iodizing of the collodion, or *vice versa*, and in such a case stains must inevitably be produced, even if the developer is poured upon and spread over the plate in the most accomplished manner.

Another disagreeable phenomenon which causes some of our colleagues much uneasiness is, the dark streak which commences at the upper end of the plate and continues down to the middle of the same, or even lower. This is the result of a freshly-prepared bath and too much alcohol in the developer. In almost every photographic manual it is stated that the addition of alcohol to the developer is only necessary when the bath has become somewhat alcoholic by the sensitizing of several plates. This warning is, however, generally disregarded, and an alcoholic developer is frequently used with a fresh bath; the result is, that as soon as the developer is allowed to run off the plate, in order that the picture may be examined by transparency, these streaks are at once formed. Many obviate the same by carefully washing the plate and removing the developer prior to an inspection of the negative, but by this means it is impossible to watch properly the gradual appearance of the picture, a very necessary part of the operation of developing. For this reason, therefore, no alcohol should be used in the developer when a new bath is employed, a little being added only when the bath has been some time in use, and the quantity afterwards increased when the bath has become appreciably alcoholic. If this precaution is properly attended to, the developer may be poured on and off, and the picture inspected from time to time, without any risk of staining.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXXIII.

THE landscape photographer could not improve himself in the esthetics of his art more thoroughly and easily than by an exhaustive study of Turner's *Liber Studiorum*, more especially if he had opportunity of comparing the original drawings with the engravings and the various states of the plates showing the many corrections and alterations of the artist in his endeavour to reach perfection. Fortunately, this study is possible to those within reach of the South Kensington Museum, where a large proportion of the drawings, as well as the engravings—either in the originals or by photographic copies—are exhibited. Many of the engravings were etched by Turner himself, who seemed so fond of some of the plates that he found it impossible to let them go, but kept retouching and finishing until they eventually were almost transformed into different subjects to the first sketch. These alterations are of extreme value

to the student, showing, as they do, the progress of artistic thought. Ruskin has said that one of the original etchings is a drawing-master in itself.

This famous work, which consisted of seventy-one drawings in sepia, fifty-one of which are at South Kensington, and in fine condition, originated in rivalry with Claude's *Liber Veritas*, a book in which this famous painter registered a sketch of every picture he painted, in order to authenticate his works. In the *Liber Studiorum* Turner intended to show his command of the whole compass of landscape art. The comprehensiveness of the scheme will be understood by a glance at the list of six heads into which the engravings are divided; viz., historical, pastoral, elegant pastoral, mountain, marine, and architectural. Turner never did anything in a fragmentary manner. He used the only method of attaining success, he did what he had to do with all his might. While on the subject of this great work of our greatest master, I may incidentally allude to the enormous

increase in value of works of art of late years: the subscription price for the "Liber" series was £17 18s., but a good copy now sells for 200 guineas. Mr. Stokes formed a complete collection, consisting of etchings, proofs, and duplicates of each plate in its various states. This collection was offered to the authorities of South Kensington Museum for £2,500, and refused; it afterwards sold in detail for more than £3,000. But expensive proofs are not necessary for the student. Photography has unlocked this treasure-house of art, that all who care may enter. Three or four years ago the late Mr. Thurston Thompson made two magnificent sets of photographs from the original drawings, which were very widely circulated, and are as valuable for study as the originals. The Autotype Company also are, I believe, about reproducing these pictures in carbon, which will be a great boon to the lovers of art.

Lessons may be learnt from every drawing in the series, but I have selected "The Stackyard" for illustration,



because of its simplicity, and because it shows how interest may be imparted to the poorest materials, when in the hands of a true artist, by judicious selection of the point of view, so that the objects may compose picturesquely and artistically, and by skilful distribution of light and shade. I of course do not suggest that the photographer has equal power with the painter in arrangement, and light and shade, but he possesses these qualifications, as I have repeatedly stated, in a much greater degree than is generally supposed. The enormous power, for instance, possessed by the photographer in the possibility of partial or local development for regulating light and shade is seldom thought of, much less used. In the "Stackyard" the general form is wedge-shaped, repeated by smaller forms of the same kind within the general form. The thin ends of the wedges are always supported or accented. See the general outline supported by the man with the barrow and the willow trees; also notice how the pool in the foreground assists in forming the wedge. The point of the wedge

formed by the rick, the two men, the ladder, &c., is supported by the white horse, while the group is balanced by the horse lying down in the foreground. It will be noticed in this picture, as in the sketch by Topham in the last chapter, that the principal dark, the interior of the barn, is in close contrast with the chief light, the white horse. This is an arrangement which, if it can be secured in a composition, always gives brilliancy and vigour.

The illustration is from a block engraved by Mr. Fruwirth's process from an admirable wood engraving by W. J. Linton, in the *Illustrated London News*. It rarely occurs that the touch of the master is so faithfully reproduced in an engraving as we see it here; this fidelity of reproduction may be especially noticed in the trees behind the barn, and in the sharp touches of shadow throughout the picture. This example affords a good illustration of the capacity of Mr. Fruwirth's process for yielding with success reduced copies of any subject produced in mechanical gradation.

ON THE EMPLOYMENT OF BLUE GLASS IN PHOTOGRAPHIC STUDIOS.

BY M. ALOIS NIGG.*

THE employment of blue glass for the first time in this country by M. Ludwig Angerer, who has glazed the entire front of his new studio with that material, has led to many discussions as to its practical value, and the various opinions expressed by competent authorities in its favour and against sufficiently prove how unprepared we are at present to form a definite judgment of its merits. On this account I do not feel myself called upon to defend my own ideas on the subject, the more so from the fact that Professor Pisko, in his last lecture upon "Light in Relation to Photography," explained in a most convincing manner the action of blue glass from a scientific point of view, the opinions expressed by the Professor agreeing perfectly with those entertained by myself.

To the remarks of the above-mentioned interesting lecture, I would supplement the opinion of another gentleman, whose experience has been gained by practical tests. Dr. Pohl, a Professor of the Imperial Polytechnic Institute of this town, instituted experiments with blue glass as far back as fifteen years ago, and arrived at the conclusion that the chemical action of the light was by its means accelerated, and that the glazing contrast of several colours was thereby softened and rendered more harmonious.

Without admitting in any way the theory based upon his observations, it is, nevertheless, certain, that not only do the active blue rays penetrate light blue and other glass of a similar description, but many of the other light rays likewise make their way through; and on this account he believes it probable that the latter have the effect of placing the blue rays in such a condition as to facilitate their transmission.

The opinion expressed by Professor Pohl, of great importance to photographers, goes so far as to presume that the same effects as those produced by the employment of blue windows, curtains, walls, &c., may be obtained in the most simple and perfect manner by using a small disc of light-blue glass ground with parallel planes, and placed either in the central diaphragm of the lens, or in front of the inner portion of the same. It is certainly desirable that the correctness of this statement should be substantiated as early as possible, and no greater incentive ought to be necessary for the prosecution of experiments of this description on all sides. For if it should be found that the action of the blue glass possesses a decided advantage, it will then be a further question whether it is necessary to employ large quantities of the material in glazing a studio—a very costly, and, at the same time, on account of the difficulty in obtaining the requisite colour, very laborious undertaking—or whether a two to four inch disc of blue glass, costing a mere trifle, would be sufficient to bring about identically the same effect; the latter contrivance possessing, besides, the feasibility of employment outside the studio, and more particularly in the taking of landscape views. Should the disc of blue glass be found to answer all requirements, then the same cannot be regarded in any other light than that of a simple and useful improvement in photographic apparatus.

I have instituted a series of practical experiments with a view to obtaining the requisite results, but have abstained from regarding the conclusions at which I have arrived as convincing arguments, or inviolable proofs, until I have had more experience in the matter. Nevertheless, a detailed description of the manner in which I am conducting these experiments may not be out of place. The following are the questions required to be solved:—

1. Is it really possible to obtain a softer blending together of antagonistic colours by the employment of blue glass?
2. Is it possible to produce the same effects by means of a disc of blue glass fitted to the lens, as that obtained by illumination through blue windows?

3. Is the photographic process accelerated by the use of blue glass?

If we refer to the circumstance of people with weak eyes, who are unable to bear the glare of a strong light, and therefore have recourse to blue spectacles, by means of which all objects are seen in precisely the same way as if they were illuminated through blue windows, we should feel disposed to answer the first two questions at once in the affirmative. As, however, we have no means of proving that photochemical agents are endowed with exactly the same kind of sensitiveness as the retina of the eye, we must leave the questions at present undecided.

In my experiments conducted in this direction I have made use of a porcelain statuette about twelve inches in height, which I photographed first of all in the ordinary manner, and afterwards through a sheet of blue glass placed before it; finally, I removed the blue glass screen, and took a third picture of the statuette with a small disc of light-blue glass fitted into the central diaphragm of the lens. This mode of operating I repeated with a portrait, employing first the blue disc placed in the central diaphragm of the lens, and afterwards in front of the inner part of the same.

The last-named operation I likewise observed by means of an orthoscope.

In another more careful and reliable experiment I employed an ordinary stereoscopic apparatus, furnished with two perfectly-identical lenses, and used the disc of blue glass in the manner before alluded to alternately with the right and the left lens. By this means it was possible to obtain upon one plate two pictures produced in the same light, by the same exposure, and under the same conditions, and calculated, therefore, to yield the most convincing results.

The pieces of blue glass, ground with parallel planes, which I employ, were purchased from M. Stettinger, an optician of this town, at the very reasonable cost of one florin each, and fulfil their object satisfactorily. A piece of blackened cardboard, made into the shape of a large pill-box lid, has an opening cut into the centre, against which the blue glass is gummed, and the whole may then be fitted on to the tube of the lens. I should also mention, that the term ground with parallel planes must not be taken in its strictly mathematical sense, as such glasses would be of a very expensive kind, and are, moreover, not needed, those employed by me answering the purpose perfectly, and not causing any malformation of the image to be reproduced; this, however, would by no means be the case with ordinary coloured glass obtained in the regular way from tradesmen.

After this explanation of the subject it is hoped that no objection will be made upon the part of photographers to undertake a few experiments in this direction, which may be carried on without inconvenience, and with very little trouble; and I would ask those gentlemen present to give the matter an early consideration, and to communicate any results they may obtain, in order that a correct and unanimous decision upon the merits of blue glass may be arrived at.

It can in no way be denied, that by using blue glass as a means of illumination, not only are obnoxious sun-rays considerably toned down, and disagreeable reflections from neighbouring buildings avoided, but the objects in the studio are lighted up in a softer and pleasanter manner; to obtain this same description of illumination, M. Ludwig Angerer coated his glass studio with starch-paste as long ago as 1861. Whether there is any other beneficial action besides to be derived in photography by the employment of blue glass remains yet a disputed point.

SEL CLEMENT.

Those of our readers who may be disposed to give further trial to the *Sel Clement* for printing will do well to follow the recent directions issued in regard to it, some of which may, by the way, be useful in relation to the ordinary silver

* Read before the Vienna Photographic Society.

printing process. A commission appointed by the Mar-seilles Photographic Society to make trial of this substitute for the ordinary nitrate report favourably, and express a conviction that it is more economical than pure nitrate of silver.

DIRECTIONS FOR USE OF SEL CLEMENT.

1. Dissolve the Sel Clement (60 grains per ounce water) in distilled water. Filter the solution (which will turn the litmus paper light red). If the colour is too deep, add some drops of ammonia, taking care not to exceed the above mentioned light red colour.

2. Float the albuminized paper two minutes only.

3. Dry; print a little deeper than wanted; tone, fix, and wash as usual.

4. If a quicker printing is required, use a bath of 30 grains Sel Clement per ounce distilled water with ammoniacal fumigations.

The following is a good toning formula, used for the present specimen.

(A) Half ounce acetate soda in 1 quart of water.

(B) Ten grains chloride of calcium in 1 pint of water; after filtering this solution (B), mix it with (A).

(C) Add 15 fluid ounces of a solution made with 15 grains chlorid of gold in 30 fluid ounces of water.

(D) Add to the whole: 30 fluid ounces of the toning bath used the day before (for beginning, water will do). If bluish black tones are wanted, a mixture of 10 grains chloride gold and 5 grains chloride platinum should be used.

4. The silver bath (marking 48 degrees English when containing 15 per cent. Sel Clement) must be strengthened with a fresh quantity of the salt when it descends below 40 degrees; the silver bath should be kept supplied according to the quantity used.

5. When the silver bath becomes too deeply coloured, filter twice consecutively through a filter-paper containing one-third of its weight of powdered charcoal.

6. Keep the sensitized paper (which will remain white for many days) protected from light, damp, and alkaline vapours, enveloped in common paper, without any other precaution.

PHOSPHORESCENT PHOTOGRAPHS.

THE *Scientific American* has some remarks on a new kind of photograph, made on the so-called phosphorescent surface, of which absolutely nothing can be seen in the daylight, but which is distinctly visible in the dark. "Many years ago," it remarks, "compounds were invented which had the property of shining in the dark many hours, and even days or weeks, after an exposure to sunlight for only a few seconds. These phosphoric compounds, called after their inventors Canton's, Baldwin's, Bolognian phosphorus, &c., were formerly of no use whatever, but it was hoped that they might eventually reveal something concerning the nature of light; and such has indeed been the case, as the phenomena connected with these experiments are a strong argument in favour of the undulatory theory, and the correlation of forces.

"An English photographer* lately conceived the idea of covering a sheet of paper or glass with a layer of such a phosphorescent substance, and then treating it in a similar manner to paper or glass sensitized in the ordinary way for taking a photograph. Pictures taken in this way seem by daylight to have no existence, but the places where the light has acted upon become phosphorescent or luminous in the dark, the shadows remaining invisible, the semi-tints slightly luminous; and the result is such a change in the surface that the picture is only perceptible in a dark room by an unearthly glow of a greenish, blue, red, or purplish tint, according to the preparation used.

"We notice this invention only by reason of its oddity, and not for its utility. The only practical use we see for it would be to terrify the uninitiated by the exhibition of luminous images of skulls, skeletons, demons, and similarly cheerful subjects suddenly appearing on the walls, window panes, curtains, or other unexpected localities at the moment the lights are extinguished. It is very easy to make such pictures. A sheet of albumen paper is moistened to make it sticky, and then equally covered with a thin layer of the

finely-powdered phosphorescent substance, or a pane of glass is covered with a thin coating of paraffine, to which also, when warmed, the powder will stick; then the prepared surface is treated as in taking an ordinary photograph, either by placing it in the camera, or exposing it for a few seconds under a positive to the rays of the sun or the magnesium or electric light.

"The only thing remaining to state is the preparation of these phosphorescent substances. One of the cheapest is Canton's phosphorus, and it is made by burning oyster shells for half an hour, powdering and mixing with an equal weight of sulphur, and heating again for one hour in a covered crucible. The produced substance must, of course, be preserved in the dark, and protected from moisture in a well-closed bottle. Wachs found that the luminosity is much increased by moistening the mixture of shells and sulphur, before the second heating, with a solution of sulphide of arsenic in liquid ammonia. The powder thus obtained emits so strong a light of blue colour that it does not require perfect darkness to perceive its glow.

"Baldwin's phosphorus, mentioned above, is prepared by dissolving chalk in nitric acid, then heating and grinding it to powder. The Bolognian phosphorus is made by simply heating a mixture of powdered heavy spar with the white of eggs, gum-water, or a solution of tragacanth. Fluor spar is naturally such a phosphorescent substance, some specimens, however, more than others, and diamond appears to be the best; but the expense of the powder would hardly admit of its employment for the above-mentioned purpose. Experiments have proved this property, in some degree, to exist in a great number of substances not suspected to possess such a singular quality; for instance, many natural compounds of lime, baryta, strontia, and magnesia, besides corals, fossil bones, and teeth, the shells of eggs, oriental pearls, dry bleached linen, white paper, and even the stones extracted from the human bladder.

"Grotz has found that the same luminous rays—the blue and violet—which produce the photographic pictures, also produce this effect, and that the rays which have no photographic powers—red and orange—not only do not produce it, but extinguish the existing luminosity. However, this is not because it is easily extinguished, as handling, and even immersion in water, will have no effect upon it, neither plunging the body in different gases. Groszer found that the luminosity was not even in the least impaired in a perfect vacuum.

"Some philosophers have already, and with apparent good grounds, mentioned their suspicion that in nature the same phosphorescence may take place on a larger scale that we see in different minerals, fossils, and preparations on a small scale; and if so, planets and comets are luminous partly by light reflected from the sun, and partly by phosphorescence of their own. That comets possess such a light of their own has been proved by Arago's conclusive observations by means of polarized light; and perhaps the peculiar appearance of the moon during its eclipse is due, besides the refraction and absorption of light in our atmosphere, to such a phosphorescence; even ice shows luminosity in the dark for several hours, when suddenly withdrawn from sunlight exposure to a dark room. The periodical obscuration taking place during the moon's phases is so slow that no phosphorescence can show itself, but on the occasion of an eclipse the obscuration is so rapid that any phosphorescence on its surface persisting for an hour or half an hour must become visible."

In a subsequent number it remarks:—

"The foreign journals report that an American has taken out a patent in France for a style of printing which may be read in absolute darkness. We have not seen an account of the details of this invention, but have no doubt that the process is similar to that of certain photographs which we recently described. Nothing is easier than to print with an ink made of powdered phosphorescent substance mixed with some gum or varnish. Such a print may be either visible or entirely invisible by daylight, according as the colour of

* Mr. J. T. Taylor, we believe

the ink differs from or resembles the colour of the paper upon which the print is made; but in order to render it visible in the dark, all that is required is simply to expose it for a few seconds to the sun, strong daylight, or to electric, calcium, or magnesium light; and when, after some time, it becomes invisible, a renewed exposure to light will make it again visible. In this respect it has a great advantage over the luminous photographs, which cannot be exposed to daylight except under the glass positive, as the whole surface of the paper is covered with the phosphorescent substance, and must therefore be preserved in the dark. The printing here described, however, improves and becomes more luminous the more it is exposed to light, as only the letters consist of the strongly phosphorescent substance, and the rest of the paper is in its natural condition; that is, it requires a very strong light to make it feebly phosphorescent.

COMMUNICATIONS ON PHOTOGRAPHY.

BY M. CAREY LEA.

I HAVE received communications from various parts of the country that furnish points of interest that seem to deserve publication.

Mr. Joseph Voyle writes me from Tuscaloosa, Alabama, that he has obtained considerably increased sensitiveness from the use of carboic acid in collodion, but still better in the negative bath. This latter assumed a violet colour, and gave plates that worked faster and better than another bath, exactly similar, without the addition.

The use of carboic acid is not new, having been suggested by Dr. Kaiser in the *Bulletin Belge*. That photographer, however, looked rather to preserving the bath from change, and does not speak of the sensitiveness being increased. This last observation, if confirmed, will be due to Mr. Voyle. Carboic acid is a reducing agent, and reduces silver at the boiling point of water. The violet colour assumed by the bath is doubtless due to the reduction of small quantities of silver.

Mr. Charles Kneeland writes me from Pittsburg, that he has tried the application of pyrogallie acid to a plate before placing it in the camera, and found a fully-exposed plate in the slide. This mode of operating was proposed in Paris some time back, with the idea, that by a proper arrangement the development might be watched through yellow glass, and the exposure stopped at the right moment. It will be observed that this method differs essentially from the self-developing plates that I lately published in this, that here all the usual manipulations are necessary, the difference being that the developing agent is applied before instead of after exposure; whereas, in mine, the plate is simply coated with a peculiar mixture, and the sensitizing and application of developing fluid are entirely suppressed. It seems doubtful, however, if the matter will be more than one of curiosity.

Mr. Kneeland thinks that plates that have received a treatment with pyrogallie acid before exposure are peculiarly sensible to weak radiations, and thinks that this principle ought to be made the foundation of a method for instantaneous exposures. He got the best results by using as a developer, water, 1 ounce; acetic acid, 1 drachm; pyro and citric acid, 1 grain each. If the citric acid was less, the exposure was increased; if more was used, the exposure was shortened, but the image almost disappeared in fixing.

Paper sensitized and treated with this last solution, and exposed under a negative for a minute or two to the light of a lamp, gave a bold and vigorous picture. Mr. Kneeland tried this for enlargements, and succeeded very well, except that after five or six minutes the paper began to stain on the back, and went on till the back turned quite black.

ON THE PREPARATION OF IODIC ACID AND IODATE OF POTASSIUM.

BY PROFESSOR J. S. STAS.*

Iodic Acid.—I prepare this acid by the action of pure iodine on normal nitric acid. To effect this I operate on four litres at a time of pure nitric acid, to which I add a tenth of its weight of iodine. The yield of iodic acid given by this method has been much exaggerated; the quantity produced only represents one quarter of the weight of the iodine employed. In order to remove with certainty the nitric acid which the iodic acid always contains, I dissolve in water the solid yellowish residue obtained on evaporating to dryness the liquid resulting from the reaction of iodine on fuming nitric acid. The solution of this crude acid, when introduced into a vessel made of glass unattacked by acids, is evaporated to dryness; the whole residue is heated to 200°, and kept at this temperature to bring it to the state of iodic anhydride, and to remove with the water the last trace of nitric acid which it contains.

As the action of nitric acid on iodine took place in a large retort of ordinary glass, the iodic acid obtained contains traces of iodates of sodium and calcium, which I have not been able to remove.

I hoped to have been able to employ iodic acid in the determination of the atomic weight of iodine; with this object I prepared more than 2 kilogrammes of crystallized iodic acid by the action of boiling dilute sulphuric acid on iodate of barium; but, in spite of all precautions, I found it impossible to prepare in this manner either iodic acid or iodic anhydride free from barium, the greater part of which existed in the state of sulphate. After the efforts I made to remove the barium, I believe I may affirm that it is impossible to prepare pure iodic acid in this manner.

Iodate of Potassium.—Requiring large quantities of this salt, I tried many methods of preparing it. Only two furnished me with a product which was unalterable in the air. One consisted in transforming an aqueous solution of hydrate of potash into iodide and iodate, by acting on it with purified iodine; the other was based upon the formation of iodate by the action of heat on a mixture of equal molecular weights of iodide and chlorate of potassium. This is how I prepared the iodate by the latter method. I mixed intimately the iodide and chlorate of potassium previously purified from foreign metals by means of a solution of sulphide of potassium. The well-dried mixture was introduced into retorts till they were about two-thirds full, and they were then placed in sand-baths. In the same bath I inserted rather deeply a small retort containing pure chlorate of potash. Each retort had connected with it a curved tube dipping into water. I elevated the temperature of the bath until the chlorate of potash in the small retort fused, and oxygen commenced to be evolved. When I had succeeded in well graduating the temperature so as not to overstep the temperature of decomposition of iodate of potash by heat (a temperature which is sensibly higher for iodate than for chlorate), I had completely transformed the iodide into iodate, and the chlorate into chloride, without any disengagement of oxygen.

To separate the iodate from the chloride I added to the mass, after cooling, cold water in sufficient quantity to disintegrate the mixture. The saline mass was then ground up, and, after being introduced into a displacement apparatus, was lixiviated with cold water until almost all the chloride was removed. The iodate was then submitted to three successive crystallizations. After each crystallization, which was effected rapidly, the salt was submitted to a methodical washing. After the first crystallization I was unable to discover a trace of chloride or iodide.

The iodate thus prepared remains indefinitely without becoming yellow in the presence of air. This cannot be said of the salt which is obtained by attacking chlorate of

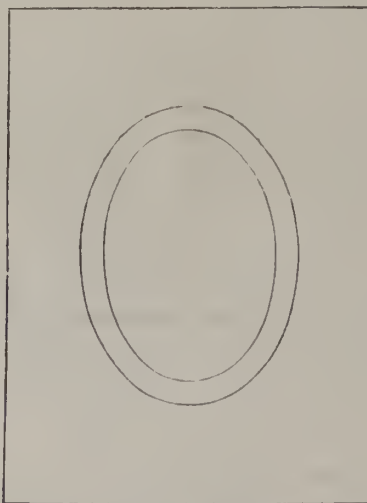
potassium by means of iodine. Even when the terechloride of iodine which is always formed along with the iodate of potassium is decomposed by carbonate of potash, the salt so produced becomes very appreciably yellow in the air, even after it has undergone five successive crystallizations, each time followed by methodical washing. I have not been able to ascertain what is the substance which communicates to this iodate of potassium the property of becoming yellow, but the fact has always been so.

CON-ELLIPTICAL VIGNETTE.

BY PROF. JOHN TOWLER, M.D.*

A VERY interesting vignette for the cabinet picture is the con-elliptical, which consists of a white elliptical space between two elliptical surfaces, which are printed whilst the space is protected.

Many of our readers may not be acquainted with the practical mode of making an ellipse, and, on this account, those who have the knowledge must not criticise us for being unnecessarily minute. The cut will help to illustrate what I mean.



In the first place, in order to make the vignette, you require an elliptical opening in a piece of tinfoil which is of the same size as the negative. This opening must be so placed as to comprehend the head and bust of the picture (the head being about one inch and a half in length from the crown to the chin). Take the tinfoil and flatten out all the creases and irregularities, and then draw a line with a blacklead pencil through the middle of each end, and find the centre of this line. Measure off one inch from this centre on either side, and drive a pin through either point through the foil into the table beneath. Now take a piece of strong thread, six inches long, double it, and make a knot, so that the length from the middle up to the knot is exactly two inches and one-half. Open this so as to comprehend the two pins within the knotted thread. Take a sharp-pointed blacklead pencil, and, placing the point on the inner side of the thread, and keeping the thread taut all the time, proceed round the thread, and make a mark on the tinfoil; this mark will be an ellipse, sufficiently large for the vignette in question. The size of the ellipse can be varied at pleasure, taking care always to make the double thread longer than the distance between the two pins, which may be placed at any distance apart desired. The next operation is to cut out (and throw away) the part of tinfoil

situated within the elliptical curve; this can be done quite easily with a sharp-pointed penknife. Now place the tinfoil with the opening in the middle over the negative, in the proper position as to the figure, so as to obtain a uniform vignette; over this lay the sensitive paper, and expose to the action of light until the picture is sufficiently printed. The next operation requires a piece of tinfoil or cardboard one-eighth of an inch larger than that cut out from the first tinfoil. Drive the pins as before, on a straight line, and two inches apart, through a piece of cardboard, for instance, and with a thread knotted as before, but whose length, when doubled, from the middle to the knot, is two inches and five-eighths, draw an elliptical curve. The space comprehended within this curve must be carefully cut and preserved.

Lay this piece of cardboard upon the print in such a manner as to overlap the print equally all round, and again expose to light until the colour of the parts exposed is the same as that under the elliptical shield. Now tone and fix in the ordinary way. You will find the majority of your customers will like this novel vignette, which costs but little extra trouble.

ON PURE WHITE GUTTA-PERCHA.

A PAPER on this subject, read by Mr. F. Baden Benger, at the recent meeting of the Pharmaceutical Conference, contains some remarks of interest to photographers. "I have examined," he remarked, "specimens of the so called 'pure white gutta-percha' now commonly sold, and find that for the most part they may have been designated almost as correctly 'pure white oxide of zinc,' being made up with this substance in very large proportions, and, I believe, thereby rendered less tough, durable, and fit for the purpose. This opinion has been strengthened by the fact that persons to whom the pure and afterwards the commercial article have been supplied have frequently complained of the inefficiency of the latter. I am further induced to describe the process I use, by the very high price required by makers of the really pure substance.

"A good sample of crude gutta-percha will yield at least 75 per cent of the pure resin. Some care should be taken to obtain a specimen with as little impurity as possible. The bottle marked No. 1 [exhibited to members] contains some of the kind I find best; it is imported in roundish blocks, which are exceedingly hard and difficult to cut, but any of the large gutta-percha manufacturers will supply the same torn into fragments similar to the accompanying specimen. Four ounces of this digested with five pounds of methylated chloroform for a few days will form a solution sufficiently fluid to filter through ordinary bibulous paper. This should be conducted in such a manner as to allow little or no loss of chloroform by evaporation, the apparatus for filtering volatile liquids described in Mohr and Redwood's 'Pharmacy' answering the purpose; the addition of another pound of chloroform rendering the filtration more expeditious. To the filtered solution, which should be bright and nearly colourless, add an equal bulk, or a sufficient quantity, of spirit of wine to precipitate the gutta-percha, which will separate from its solvent as a white bulky mass; this should be rinsed with spirit, pressed in a cloth, and dried by exposure to the air; its condition is then that of the accompanying specimen, marked 'No. 2,' perfectly white, but too porous for dental use. It should then be boiled for half-an-hour in a porcelain capsule, and rolled in sticks whilst hot, as specimen 'No. 3.' The chloroform can now be separated from the spirit by the addition of water; and, lastly, the spirit from the water by distillation, at the leisure of the operator.

"There is, therefore, no reason why the chemist should not prepare this substance himself, and if he is careful to prevent the loss of chloroform and spirit in the process, its reduced cost and greater purity will compensate him for the trouble.

Talk in the Studio.

OUT-DOOR MEETING.—On Saturday last the South London Society held an out-door meeting at Hampton Court. Some members brought cameras, but the majority contented themselves by examining the fine palace which Cardinal Wolsey built, and the pictures, &c., it contains, and by rambling and enjoying the picturesque country. All met together to "high tea" at *The Mitre* at 5 o'clock, to chat over photography—its processes and prospects.

MR. BLAIR'S CARBON EXPERIMENTS.—Mr. Blair, of Perth, has favoured us with two interesting examples of carbon printing, by processes with which he has been experimenting lately—one with good half tone, without transfer, which is excellent, and derives additional value from being a portrait at all, and another of himself, with one transfer only. More particulars shortly.

TONING BATH OF SULPHOCYANIDE AND HYPOSULPHITE OF GOLD.—Our friend Dr. Liesegang writes to the effect that since we published his formula for a toning bath containing sulphocyanide of gold and hypo, he understands that some English photographers have not succeeded in obtaining good results with it, and encloses us some fine toned prints to illustrate its capabilities. We may add that we have ourselves tried it, with—so far as the tones are concerned—the most perfect success. Dr. Liesegang adds:—"At present I do not say anything about the permanence of the prints; but since I have worked this method I have not had one which has changed. About three thousand have been treated in this way in my studio. I shall keep them until they are one year old, and if then they are good I shall present them to the readers of my journal."

PHOTOGRAPHIC EXHIBITION IN HAMBURG.—A photographic exhibition will be held in Hamburg in November, to which English photographers are invited to contribute. Dr. Liesegang kindly offers, if our best men will send examples of their work to him, unmounted, by hook post, to get them mounted suitably, and exhibit them collectively. We hope that photographers who can worthily represent English photography will avail themselves of this courteous offer.

LIQUID GLUE, BY M. KNAFFL.—This useful article, which is employed for a variety of purposes—as mending porcelain, glass, mother-of-pearl, &c.—is not nearly so good when prepared with vinegar and nitric acid as that obtained by the following process:—Three parts of glue broken into small pieces should be covered with 8 parts of water, and left to stand for some hours; one-half of chlorhydric acid and three-fourths of sulphide of zinc must then be added, and the whole exposed to a temperature of from 81° to 89° C. during ten or twelve hours. The compound thus obtained does not gelatinize; it only needs to be allowed to settle, and will be found a most useful agent for joining purposes.—(*Wochenschrift des Niederösterreichischen Gewerbevereins*).—[It is scarcely necessary to say that this glue must not be used for mounting photographs.—Ed. P. N.]

THE GERMAN OBSERVATIONS OF THE ECLIPSE.—A correspondent of the *Times* gives a short account of the operations in photographing the eclipse at Aden. He says:—"On the evening of the 17th almost all the rank and fashion of Aden made an exodus to Marshag-hill, the eastern promontory of Aden, where the German party were established with all their instruments. The night was very cloudy, and much anxiety was felt by all interested in the success of the observations. At grey dawn, however, and just before first contact, the banks of clouds separated into broad bands, occasionally shutting out a view of the eclipse. Totality commenced at 6h. 29m. 28s. A.M., and lasted 2m. 55s., during which interval a most magnificent view of the phenomena was obtained, and four most successful photographs were taken. The only planets and stars observed during the totality were Venus, Jupiter, and Sirius, which at once shows that the darkness was not great. At the time of totality the height of the tide was 7½ feet, or for Aden a good average spring tide. The preceding spring tides (about a fortnight before) were very bad, the rise and fall not being more than 4 feet. On first separation a most beautifully soft light stole out from behind the moon, lighting up the sea and rocks of Aden in an indescribably beautiful manner. The sun was, unfortunately, behind a cloud at the final separation, which could not be,

therefore, determined within a second of time. The times were, of

						H.	M.	S.
Totality ...	...	...	...	...	...	6	29	28
First separation ...	...	...	...	...	...	6	32	23
Totality...						0	2	55

The German party were delighted with all their experiments, and consider themselves amply repaid for their trouble. They had most superb instruments, and were particularly civil and obliging in explaining their use, mechanism, &c. Among the most interesting was a photographing telescope, which is made self-acting by means of a most ingenious clock-work mechanism, which, with the help of a simple pendulum and endless wheels, is so delicately adjusted as to counteract the motion of the earth, and to keep the telescope rigidly fixed on the star or planet during the ten or fifteen seconds required to receive the impression.

THE INVENTOR OF GUN-COTTON.—*Galignani* announces the death of Schonhoin, the inventor of gun-cotton, and, as it is believed, of collodion also, for it is asserted that he was aware of the solubility of gun-cotton in ether. His name is also associated with the discovery of ozone. He was 69 years of age.

ACCIDENT IN BOILING DOWN A BATH.—A correspondent sends the following account of a singular accident in boiling down a bath:—"I have just met with rather a curious accident whilst boiling down an old silver bath. It was in an evaporating dish over a gas boiler; I had just raised the gas slightly, the more readily to fuse the nitrate of silver, as the water had quite evaporated; the dish split, the silver poured down through the wire gauge of the boiler, which it consumed like so much paper, and a most furious combustion took place upon the bench, which lasted about twenty seconds. At the end of that time there was a deep hole burnt in the bench, and all that remained of the silver was a very little light-coloured ashes, which, as far as I have been enabled to examine it, is perfectly valueless."

To Correspondents.

P. F. P., referring to the Eburneum process, asks whether the pictures are reversed, adding: "I think it is the wrong side of the picture which is seen, and consequently, with all its beauty, I do not think the process worth the trouble." Now a very little reflection might have satisfied our correspondent that in a process of camera printing he could either produce the image in its proper position as in a paper print, or in its inverted position as in a direct collodion positive. It depends upon whether the negative is placed in its groove in the copying camera with the film facing the light or facing the lens. He should also remember, however, that he requires to produce a reversed image on the glass, because when the picture is finished it is the back of the collodion film which meets the eye, and the image which appeared inverted when on the glass is non-inverted when on its Eburneum support.

W. G.—Your microscope will furnish the chief necessities. We cannot describe the operations at length here; but you will find satisfactory instructions by Mr. Cherrill on page 56 of our *YEAR-BOOK* for 1866. 2. You have probably used the acids too strong, or the temperature too low. Agitation with a little carbonate of soda or potash may now help you. The presence of methylated spirit often tends to prevent the liberation of free iodine. 3. We shall have pleasure in examining the results to which you refer.

SILEX.—Gelatin does not form an insoluble compound with silver, like albumen; on the contrary, gelatin may be dissolved in a solution of nitrate of silver. 2. The accident you met with is very singular. We print the statement in another column.

A DILEMMA.—The milky appearance assumed by your solution of pyrogallie acid in distilled water when a few drops of silver are added may arise from a variety of causes. Sometimes the acetic acid contains a trace of hydrochloric acid, and this would cause a slight turbidity from the formation of chloride of silver. Possibly the silver solution is taken from the nitrate bath, in which case turbidity would be caused by the precipitation of iodide of silver. Do you find any special inconvenience follow this turbid appearance?

A. LADY.—Unless our fair correspondent is familiar with the various modes of intensifying, or is prepared to experiment a little, so as to master their peculiarities—in which case almost any of them

would give good results—we can recommend nothing simpler and safer for intensifying a fixed negative than pyro and silver. Try 3 grains of pyro and 3 grains of citric acid in an ounce of water. Flood the plate with this until it flows easily, then pour it back into the developing cup and add a few drops of a 20-grain solution of nitrate of silver, and apply it again to the plate. This, as a rule, will intensify satisfactorily. Washing the film first with the solution of iodine, rinsing, and then applying the pyro and silver, sometimes makes the operation still more satisfactory. Let us know if you succeed with this.

W. G. G.—We have not had time for fully and carefully testing your collodion, but have made one or two trials. It is somewhat thin and limpid, and when applied to the plate so as to secure a thicker film gives a much more creamy coating in the nitrate bath. This suggests that probably a little more cotton would be an improvement, although, as a rule, 6 grains should be enough. We have used samples of which 10 grains were necessary to give a satisfactory body. Having a large proportion of a bromide, a strong bath or long immersion will generally be necessary to sensitize the plate properly. Probably, moreover, another grain of iodide of cadmium per ounce might be an improvement. It is very probable that the collodion in its present state would work well in a dry process.

W. J. A. G.—Mr. England in his last year's campaign did not use distilled water at all, but he had generally access to pure rain water. As a rule, we recommend distilled water for the first wash after leaving the nitrate bath; after that it is of less importance. The chief object of using distilled water is to avoid contact between silver solution and any of the salts in common water, such as chlorides, carbonates, &c., by which traces of insoluble silver salts might be formed on the film. Very thorough washing after applying the albumen is not necessary. We should regard "a few drops" as meaning six or eight. In no case is the silver solution to be added to the albumen, but in all cases applied separately, as directed. For winter use, first white of egg, and after that a 30-grain silver solution; for summer use, dilute albumen, followed, in like manner, by dilute silver solution.

G. K. W. (Massachusetts).—We believe that arrangements are in progress for a sale of Mr. Woodbury's American Patent to Mr. Pollock, with whom then all arrangements for licenses, &c., would rest; and he will, doubtless, make the matter known to American photographers. Thanks for the photographs, which are very excellent, both portraits and landscapes. The group is very successful. What a pity none of them has any name written underneath! Avoid using a tint of a decided sulphur yellow on your mounting boards. A true India-tint is much more neutral, and much more satisfactory in its effects on the picture.

W. H. W. (Ross).—Thanks for your friendly letter. We will bear in mind the suggestions in further experiment.

J. M. (Bath).—We cannot state with absolute accuracy the relative distances between the component lenses forming the triple combination; but the distance of the back lens from the back surface of the central negative lens is about twice the distance between the front surface of the central lens and the front lens of the combination. 2. We should not use as much bromide or iodide as you propose; from 4 to 5 grains of an iodide, and about 1 grain of a bromide, is a good proportion for collodion for the wet process. The proportion of salts does not usually affect the collodion as to crappiness, except so far as it sometimes happens that water is used in assisting to dissolve them, and water will produce crappiness. 3. Mr. Breese does not get instantaneous pictures by moonlight, nor asserts that he does. The moon, and sometimes light clouds immediately in contact, are, of course, genuine moonlight pictures, but the landscapes into which they are printed are, of course, taken by sunlight. We believe that Mr. Breese once produced a photograph of a white statue by moonlight, with a very long exposure. 4. We are glad that you find the albumen and alc process so satisfactory. Mr. Davies, of Edinburgh, was, we believe, the inventor. 5. The composition of *Sel Clement* is a secret. It is said to consist of nitrate of silver and nitrate of magnesia.

J. H. (Birmingham).—It is probable that you have added too much water, and possibly too much salt. If too much water be employed, the chloride of silver precipitates very slowly; and if too much salt be added, the chloride of silver becomes partially dissolved again. Add a little nitric acid, and agitate the water; this will assist the chloride in falling. 2. Your statement and question as to your prints are rather too indefinite to enable us to help you. "Some days," you say, "my prints are very dull, as if on badly albuminized paper; other days they are brilliant and full of gloss: will you tell me the reason and remedy?" It may be that the albuminized paper does vary in quality; it may be that the negatives are not always good; it may be that the silver bath gets too weak, or that the paper is floated too short a time; it may be that the prints are at times washed excessively before toning; it may be that the toning bath is not in good order, being possibly newly made and bleaching considerably; it may be that at times the printing is

done in the sun instead of in diffused light; or it may be that other reasons exist. You must be a little more precise in the statement of your operations and conditions before we can give you efficient advice. 3. To obtain highly glazed prints use highly albuminized thick *Rive* paper, a 60-grain bath, and a good negative. To obtain black tones, use the lime bath, made a couple of days before use.

B. A. G. (Fulham).—As a rule, the smaller the amount of light, the more difficult it is to obtain intensity in a negative, and, therefore, when producing an enlarged image with a lens considerably stopped down, it is more difficult to get a vigorous negative than when working with a large aperture upon a well-lighted subject; the ordinary gelatino-iron developer will, however, generally suffice, when sufficient exposure is given to produce a dense image. We have not tried the nitro-gelatino-iron developer, but as nitric acid does not generally tend to density, we should scarcely use it in such a case. If the collodion and bath are in good order, a full exposure and gelatino-iron developer ought to give sufficient intensity. Should it fail to do so, it will not be difficult to get any amount of intensity after fixing, by first applying mercury and iodide, and then following with pyro and silver. 2. The developed print is somewhat a sad affair, but scarcely surprisingly so. When you try again, do not attach the paper to glass by wetting it, which is a tolerably sure means of staining the back of the paper. Next, remember that to attempt to get a print on paper by exposure in the camera with diffused light is a comparatively hopeless operation. Instead of an exposure of 10 seconds to a minute, it is probable that half an hour would not be more than sufficient. Further, until you are very familiar with printing by development, do not use hot gallic acid solution. Both in exposure and development take care to keep the back of the print dry.

JOHN MACK.—Your lighting appears satisfactory, and the work generally is very excellent indeed. We hope that you will find the new premises answer in every way.

J. H. UNDERWOOD.—Mr. Thompson, 48, Pall Mall, is the person, we believe, about whom you inquired in reference to the issue of coloured photographic landscapes.

W. DURANT.—We shall be glad to see examples of your continued progress.

CLIFTON.—We have received a portion of a letter dated "Clifton," without the conclusion or signature. When we receive the name of the writer we will answer by post.

L. B.—We have seen the theory as to the part played by organic matter to which you refer, and we agree considerably with the writer. 2. We have no objection to theoretical contributions; but, as a rule, we reject speculative articles. They may be at times interesting, and even occasionally useful; but much depends on the quality of the mind which speculates. The speculations of the writer in question are generally interesting, and often useful. 2. We have had occasion more than once to refer to the presence of a visible image on a wet plate before development, and to point to its bearing on the chemical theory of the latent image. The subject is not of sufficient importance to re-discuss at present. You will find an allusion to the fact that a visible image is sometimes visible on the wet plate, and the reasons why it is not generally the case, on p. 423 of our Ninth Volume. Thanks for your kind remarks and good wishes.

H. S.—Received too late for attention this week.

Several correspondents in our next.

Photographs Registered.

- MR. A. BEATTIE, Preston,
Two Photographs of Rev. Father Betham.
- MR. T. M. BIRD, Cheltenham,
Three Photographs of Mr. H. B. Samuelson.
- MR. W. V. MUNRO, Edinbro',
Three Photographs of Rev. Sir H. W. Moncrieff.
- MR. S. HOGGARD, Redcar,
Photograph of Joseph Dodds, Esq.
- MR. THOS. BARNARD, Cirencester,
Three Photographs of Sir F. Goldsmid's Seat at Rendcombe.
- MR. T. PATRICK, Penmaenmaur,
Four Photographs of Right Hon. W. E. Gladstone.
- MR. W. H. FOX, Weymouth,
Photograph of Congregational Chapel, Gloster Street, Weymouth.
- MR. J. D. WATMOUGH, Nailsea, near Bristol,
Photograph of Rev. John Philp.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
India-Rubber as a Protection for Negatives	445	Solar Printing by Development	453
Paraffine in Encaustic Pastes	445	Reactions of Hyposulphites and Sulphocyanides upon Albumen	
Uncertainties in Dry Processes	446	Prints. By M. Carey Lea	453
I. Photographic Apparatus "Personal Luggage?"	447	Proceedings of Societies—Liverpool Amateur Photographic	
Critical Notices	447	Association	454
Carbolic Acid in the Silver Bath	448	Correspondence—Sugar in Printing Bath—Automatic Syphon...	454
Visits to Noteworthy Studios	448	Talk in the Studio	455
Photographic Observation of the Eclipse	449	To Correspondents	455
Pictorial Effect in Photography. By H. P. Robinson	451	Photographs Registered	456
Dr. Towler on the Coffee Process	452		

INDIA-RUBBER AS A PROTECTION FOR NEGATIVES.

It is somewhat singular that in almost every photographic purpose to which india-rubber has been applied, it has turned out a disappointment and a failure. About a twelve-month ago considerable attention was called to its use as an adhesive medium for mounting photographic prints, and sanguine persons saw in the waterproof layer it interposed between the picture and the mounting board not only immunity from the dangerous decomposition which such materials as gum, paste, and glue are supposed to undergo, but a protection from hyposulphites or other injurious materials in the cards themselves. After a few months' trial, the issue has been in a large number of cases, as we feared it would, that the prints have curled up and left the mounts, the adhesive quality of the elastic gum having been insufficient to preserve the attachment between the print and the mount. We have heard of many such cases, and, as time progresses and the india-rubber undergoes its inevitable change into a pliable resin, we fear that many more disappointments will be experienced.

We have recently had our attention called by a correspondent of very extensive experience to another very serious failure in india-rubber to subserve the purpose for which it was proposed. A few years ago its use was suggested by a gentleman of high repute and large practical skill as a means of preserving negative films from cracking. The negative was to be treated with a coating of india-rubber previous to varnishing with the ordinary spirit varnish. It was not unnatural to suppose that two valuable ends would be gained by this treatment: first, it would give a waterproof coating to the film, which would effectually protect it from moisture; and second, by interposing an elastic layer between the film and varnish, it would protect both from the effect of unequal contraction and expansion. This seemed probable in theory, and was said to be borne out by practice. Our present correspondent calls our attention, however, to a disastrous and unexpected result. A large number of negatives have been so treated, and in almost every one the film has cracked; whilst others, produced and kept under the same conditions, but treated with less care, inasmuch as the india-rubber was omitted, in every instance remained without injury.

Another difficulty was also experienced, in some cases, with the india-rubber coated negatives. The soft nature of the india-rubber layer, even after it was coated with the spirit varnish, was found to militate materially against the protection of the negative. Instead of the hard, glassy sur-

face which a good varnish should yield, permitting the negative to be submitted to any reasonable kind of treatment in printing, it was found that the triple film remained soft, and very easily scratched and abraded, so that almost as much care was necessary to prevent injury as if the negative were unprotected altogether.

These are important facts to be noted, and we shall be glad to learn the experience of others in the same direction. Mr. Woodbury has recently found that the perishable or changeable nature of india-rubber renders it a very undesirable adjunct in forming a layer to act as a support instead of glass for transferred negatives, and finds gum-arabic a more suitable material. Has any one found any disadvantage from the use of gum as a preliminary coating? We have no doubt that cases may be cited in which india-rubber has not disappointed its votaries. Single failures may be exceptional, and still a few such destroy certainty, and it is only by a careful and extended collation of cases, with precise conditions stated, that we can hope to arrive at certain and satisfactory conclusions.

PARAFFINE IN ENCAUSTIC PASTES.

A CORRESPONDENT who has had some difficulty in procuring pure white wax—the sample he has obtained being considerably contaminated, apparently, with fatty matter—reminds us of our former suggestion that paraffine may be substituted for the wax, and asks if it can be employed in the formulæ given in our last.

We may say at once that paraffine, we fear, cannot be substituted for wax in these formulæ, or in the preparation of encaustic pastes generally, and that its value for application to photographs will be much more limited than we at one time—after some early experiments—hoped. Since we last called attention to it we have experimented pretty considerably with its various preparations, treating photographic prints with decreasing satisfaction, and a growing conviction that the end desired in applying it to photographs could only be obtained by the use of pure wax.

It is, in the first place, a difficult thing to make and keep an encaustic paste of paraffine, from its singular tendency to crystallize out of its solvents, whether the proportion added have been sufficient to form a paste or a solution. If a solution containing fifty grains (say) of paraffine in an ounce of benzole be prepared at a temperature of 70° Fah., it is probable that if the temperature fall to 60°, much of the paraffine will be found to have crystallized out of the solution. If a thick paste be prepared by shredding the paraffine fine, melting it, and then adding sufficient benzole to make the consistency required, it is probable that in a few days the solvent will be found to have partially separated, and the paraffine will show a tendency to crystallize. When this

paste is applied to the albuminized print—especially if the weather be cold—instead of assuming that soft, unctuous quality which characterizes wax, and which finally yields, on continued rubbing, a hard, polished surface, it behaves quite differently. When the solvent has evaporated, the paraffine begins to assume the form of dry scales, which rub off the print instead of adhering to its surface, so that it is difficult to obtain more than a very slight coating of the material on the surface of the print, and therefore impossible to secure the same depth and richness which can be obtained with a paste of which wax is the chief constituent.

Pure white wax can generally be obtained of retail chemists. It is supplied in round cakes at a few pence per ounce, and is in this form, as a rule, tolerably pure. Unfortunately, when contaminated with other fatty bodies, it is very difficult to separate the two, as most of the solvents of the one are also solvents of the other, and it is not less difficult, except to persons accustomed to chemical manipulations, to test the wax for fatty adulteration. Where difficulty in obtaining a pure sample exists, it may not be equally difficult to obtain honeycomb from which the honey has been removed. This, after well cleansing with boiling water, may be safely employed in preparing encaustic paste for photographs.

We may add here, for the information of those who have difficulty in procuring pure materials, that Mr. Newman, of Soho Square, is preparing encaustic paste made after M. Adam-Salomon's recipe, for commercial supply, and a sample of it forwarded to us answers admirably.

UNCERTAINTIES OF DRY PROCESSES.

ONE of the greatest boons which a trustworthy experimentalist can confer on the photographic community, or at least of the amateur portion of it, will be the accurate determination of the causes of uncertainty and discrepancy of results in the dry processes generally. It is of less importance to produce a rapid dry process than it is to produce a certain one. There are at least a dozen dry processes in existence with which those *au fait* at their practice produce charming pictures, but there is scarcely one in regard to which most contradictory experience is not described, and with which, instead of successes, a large number of experimentalists make woeful failures.

The discrepancy of result described does not occur simply in the hands of novices or bunglers, but often in the practice of men of approved ability. It is no uncommon thing to us, it is true, to receive communications from readers, who, having read the account, carefully stated by a practical man, write, saying: "I have tried the process most carefully, following the instructions precisely as they are given, and after exposure and development, do not find the ghost of an image." Sometimes we can trace such failures to some gross error, as when a correspondent trying a very rapid plate on a bright open subject, which should have required fifteen seconds, explains that he gave it eight minutes, and was surprised to find the film blacken all over immediately the developer was applied. At other times we can gain no clue to the source of failure, and having carefully gone through the operations ourselves and succeeded, we can only recommend the novice to overhaul his materials carefully, begin *de novo*, and try again and again until he succeeds.

But it is not to the uncertainties experienced by novices that we refer, but to those of practical and thoroughly trustworthy men. Take an illustration: some weeks ago we published an extract from a letter from Mr. Russell Manners Gordon, in which he stated that he found gum plates keep four months before, and six weeks after exposure, without the slightest deterioration, the plates developed six weeks after exposure being, if anything, finer than those developed on the same day. Almost contemporaneously we find M. Constant-Delessert, of Lausanne, writing to the effect, that having been, during the hot weather,

testing the relative keeping powers of coffee and gum plates, he finds the coffee plates keep well, but not the gum plates, the latter reddening all over in six or eight days. We have scarcely read these remarks before we meet with the experiences of Dr. Towler with coffee plates, which he prefers to any other, where the plates have to be used within a day or two; but adds that he would not have confidence enough in these or other dry plates of a month old in a case where success was of importance.

This is by no means an exceptional illustration of the discrepancy in experience to which we have referred in the hands of capable men. Mr. Gordon is, perhaps, the most extensive and skilful experimentalist of any we know. He has tried almost every dry process in existence, not in a merely desultory or casual manner, but comparatively with other processes, and under varying conditions, and has tabulated carefully all the results with the qualifying conditions. He is, moreover, a man of most fastidiously faultless taste, and to satisfy him a negative must possess all the technical perfectness upon which the capacity of pictorial excellence so much depends. In his judgment, which possesses the highest value, the gum process is the most perfect he knows for keeping, as well as for the excellence of its results. M. Constant is a gentleman well known to photographers as an ardent experimentalist, especially in dry processes, writing with evident knowledge and judgment, and, from the examples of his work which we have seen, we believe him to be a highly skilful as well as an enthusiastic amateur. He finds that gum plates give him more charming results than any other, but, instead of keeping months, they are spoiled in a week, whilst coffee plates keep. Dr. Towler, whose name has been known for years to photographers as that of a constant experimentalist and able writer on photography, and whose dry plate work we have often seen, likes coffee plates best, when kept only a day or two, but loses faith in them afterwards.

No such uncertainty as this prevails in the wet collodion process. Varying degrees of excellence are found in results, generally clearly traceable to varying degrees of care and ability, or differences in material facilities. Dr. Towler says, in terminating some remarks which we quote on another page: "Finally, I think I can get a good negative with almost any of the dry plates in vogue, and I start for Niagara Falls, in a few days, to work with the wet process!"

In what, then, consists the elements of uncertainty in dry processes? We cannot tell. There is but one dry process in which we ever heard of any approximation to general certainty—indeed, in relation to which we do not remember to have heard of any case of absolute failure—and that is the collodio-albumen process. It does not, indeed, possess nearly the rapidity, except pushed with hot developers, of some other processes; nor is it so rapid or simple in manipulation; nor, without the final wash of gallic acid, will the plates keep indefinitely. But it does seem tolerably certain. Few, if any, fail with it. Mr. Mudd has more confidence in a collodio-albumen plate than a wet plate. Mr. England, with his process, which is but a simplified collodio-albumen process, produced last summer three hundred negatives, never once unpacking his wet plate appliances, which he carried with him as a *dernier ressort*. An achievement like this is a tolerably close approximation to certainty; but we wait to see it repeated in other hands.

We conclude by repeating our first remark, that one of the greatest boons which can be conferred upon photographic amateurs will be a knowledge of the causes of uncertainty in dry processes. To determine this absolutely a more perfect understanding of their theory than has yet been attained will be necessary. This part of the subject we do not propose to treat here, but shall probably have something to say on it shortly. We have, however, one or two hints to offer on the question of practice. As in the dry processes the operations are more numerous, whilst the conditions of success appear to be comprised within narrower limits, cleanliness and neatness in manipulation, and pre-

cision in carrying out prescribed formulae, become more absolutely imperative than in the wet process, which permits some licence, both in manipulation and formula, without risk of failure. Next as to keeping properties. In our observation the keeping properties of plates are quite as much affected by the mode of keeping as the mode of preparing them. The boxes should be quite dry, and absolutely air-tight. The latter condition may be secured by placing gold-beaters' skin over the joint formed by the lid of the box. Damp and foul air will prove fatal to the keeping of the best plates, prepared by any process.

IS PHOTOGRAPHIC APPARATUS "PERSONAL LUGGAGE"?

A QUESTION of some importance to photographers, both professional and amateur, is at the present moment *sub judice*. Is photographic apparatus "personal luggage"? That is, can a photographer pack up his apparatus in a box for transit during a tour, short or long, and require that it shall be conveyed by the trains by which he may travel under the same conditions as the portmanteau containing his wardrobe? At the first glance it would appear so perfectly a matter of course that he should do so, providing that it did not exceed the proper weight, or require an especial treatment during carriage, that one would not dream of asking the question. The question has been raised, however, by a company declaring that photographic apparatus conveyed under such circumstances was not "personal luggage," and not, therefore, subject to the conditions obtaining in regard to personal luggage. The following are the facts as stated by a correspondent:—

"Mr. Owen Angel, the well-known photographer, of Exeter, lately brought an action against the South Devon Railway Company for the recovery of £2 14s. 9d., the claim arising under the following circumstances. He was engaged to go to Bovey, to do some work for a gentleman residing at that place. He left Exeter by the morning train, and took with him a box containing his photographic apparatus, which was duly placed in the luggage van. On arriving at Newton, where a change of carriages takes place, it was discovered that the box was missing, having been taken out by the Company's servants at Teignmouth in mistake for Bovey. In consequence of this the photographer had to return to Exeter. On the following day he posted to Bovey, and he now claimed the sum named for travelling expenses and loss of time. The Company disputed their liability, on the ground that 'photographic apparatus' was not 'personal luggage.' His Honour the Judge said he would take time to consider, and give his judgment at the next meeting of the Court."

The question must of course be decided by law, and should the decision of the Judge in the County Court be in favour of the dictum of the Company, we hope a case will arise in which the decision of a higher Court may be obtained. We are assuming for a moment, however, as a possibility, a decision which is scarcely probable. Presuming that no definition of personal luggage is found in any of the railway statutes in existence, or in the Standing Orders, or By-laws, the decision must be left to precedent and common sense. The latter certainly suggests that, provided a box does not exceed the proper weight allowed to the passenger, nor require facilities for conveyance other than are common to luggage, it cannot possibly concern the Company what that box contains. It cannot possibly concern the railway authorities whether it contain a black calico tent in which the photographer chooses to enshroud himself, or a black domino as his costume for a masquerade. It cannot be a matter of interest to them whether the box contains a camera or dressing case, if both are within the proper weight. We believe that precedents already exist in which a similar estimate of the case is taken. We are assuming, of course, that no qualifying circumstances beyond those stated exist

in this instance. If so, little doubt can be entertained as to the issue; nevertheless, photographers will look with some interest for the decision.

Critical Notices.

"RETURNING HOME." A PICTORIAL COMPOSITION, Photographed from Nature by H. P. ROBINSON.

As Thomson is the poet of the seasons, so may Mr. Robinson be regarded as their photographer. He is evidently a lover of nature: a keen observer of her varied phases, and a lover of English rural life and its varied episodes. We have had from his camera "Early Spring," and "Autumn," and "May Gatherers," and "Gleaners," and many other pictorial photographs of similar subjects. Whilst others have discussed the art powers of photography, he has demonstrated that power by producing pictures, the true art and beauty of which have won the recognition and praise of the most cultivated artists and art critics.

In his last attempt to demonstrate the capacity of photography as a fit vehicle for art expression—a composition twenty-four inches by seventeen inches in size, produced from five negatives—we have another autumnal aspect of nature. "Returning Home" represents a scene and incident common enough during autumnal months, and very beautiful in effect, but almost as difficult to render by photography as they are beautiful: A broad stretch of champagne country, not absolutely flat, but with sufficient undulations to give a picturesque character without interrupting the range of vision over many miles, until the plain meets the sky. The foreground is rich with clumps of underwood: the bramble teeming with wealth of rich blackberries; the twisted wild briar red with hips instead of roses; furze, and bracken, and grasses, all give a most inviting charm to the near landscape. The middle distance is in part the same, and part more perfectly wooded; the tender far distance appears to be of the same character, but there is no effect of tameness or monotony.

The time is manifestly towards evening, and there seems to be a dewy, moist feeling in the atmosphere and on the landscape, as when—

"The western sun withdraws the shortened day,
And humid evening, gliding o'er the sky
In her chill progress, to the ground condensed
The vapour throws."

But the sun is not yet withdrawn; two-thirds of the picture are bright with sunlight which glints on rock, and stone, and leaf, each sparkling as they catch the direct ray; light, bright, feathery wreaths of cloud spreading the light in this portion of the picture, and producing a rare sunniness. The other portion of the picture, sky and landscape, are wrapt in gloom. A sudden squall has arisen, obscuring the heaven and overshadowing the earth:

"a burst of rain,
Swept from the black horizon, broad descends
In one continuous flood."

The flood of rain descends like a broad grey wall, a strange contrast with the sunny sky it is rapidly sweeping over, shutting out its brightness and dimming the horizon. Hastening from the rain, though scarcely likely to escape it entirely, is the one figure in the landscape, a rustic lass with a sheaf of "gleanings" under her arm, her head and eyes half turned round towards the dark shower which seems rushing on as if resolved to overtake her. This figure gives the name to the picture; she is "Returning Home" from the wheat field.

The scene, as we have said, is one somewhat difficult to render. It is closely studied from nature, or rather it is nature absolutely produced from the actual phases represented. But it is no easy task to render by photography, in one picture a sunlit landscape with only delicate, light cloud

shadows flitting over one portion, and the grey gloom of a rain-squall overshadowing another. Few photographers would have dared to attempt such a scene, still fewer would have so far succeeded. In many respects this is one of Mr. Robinson's most successful pictures; it is wonderfully full of tone and harmony; wonderfully full of light and atmosphere; and it possesses a singular technical perfectness as a photograph. The figure is admirably placed, and is full of "go," and the landscape is charming, both in detail and as a composition.

The open Kent scenery is essentially different from the heavily-wooded character of the Warwickshire, which has furnished the scenes from which Mr. Robinson's pictures have hitherto been elaborated. With fresh scenes often comes fresh zest, and we hope for many more similar photographic triumphs in the field of pictorial art from Mr. Robinson's hands.

CARBOLIC ACID IN THE SILVER BATH.

THE use of carbolie acid in the silver bath, suggested some time ago by Dr. Kaiser, has not received the attention which it will probably be found to deserve. Mr. Voyle, a correspondent of our Philadelphia contemporary, describes the beneficial results of some experiments of a purely empirical character, but no one seems to have examined the subject with a special regard to the known peculiar reactions of carbolie acid. One of the common sources of trouble to the photographer is the tendency in old baths to fog, caused by the decomposition, or of the alcohol and other organic substances which accumulate in his bath giving rise to aldehyde or bodies of similar constitution, from the presence of which fog must inevitably follow. Carbolie acid has the especial peculiarity of arresting decomposition and fermentation, and it is reasonable to believe that in the nitrate bath it would prevent the fermentation change which alcohol undergoes in the bath, and so check the troubles which follow.

In preventing the decomposition of albumen, this substance should be invaluable to preparers of paper, and to dry-plate men its use in preventing fermentation in preservative preparations should not be overlooked. We have already pointed out its value in preventing putrefaction or fermentation in adhesive materials, such as gum, paste, glue, &c.

Mr. Voyle says that by adding a trace to his negative bath he gains the following advantages:—

"Increased sensitiveness.

"Less liability to change or go out of order, allowing the bath to be kept nearer neutral, mine being but slightly acid.

"A developer can be used with less acid; often with none.

"I have repeatedly developed pictures with no acid in the developer (simple iron and water). They come up just as with the acid developer. There was no tendency to crawl. But sometimes this result was not obtained; why, I have not yet discovered. One thing, however, I have noticed: the bath solution must flow evenly over the plate before it is removed and exposed.

"The colour of the bath is pink, deepening into red. I do not attribute the colour to silver in a reduced state, for it will not settle or filter out. I am inclined to the belief that it is of the nature of the aniline colours. I can, as yet, neither precipitate, change, or destroy it. Sometimes it becomes slightly turbid. It is cleared by shaking with kaolin, and subsequent filtering.

"My reason for first trying it was its action when combined with iodine for medical purposes. Supposing it might have some action on iodides I tried it first in collodion; the bath became so much discoloured that I abandoned it, notwithstanding its evident advantages. Each plate added more acid to the bath. A constant quantity in the bath proving itself to be of the same benefit, I used it thus, and am still using it."

VISITS TO NOTEWORTHY STUDIOS.

M. REUTLINGER'S STUDIO IN PARIS.

DURING the last three or four years English photographers have become familiar with certain card portraits—of actresses, chiefly—published in Paris and sold in this country, possessing specific qualities which have won general admiration. For the most part they consisted of a large head and bust vignetted. The arrangement of a head and bust for vignetting is not supposed generally to give much scope for skilful and artistic posing; but in these pictures the turn of the head and the point of view selected were always graceful and striking. The lighting of the pictures was always admirable, and they possessed a degree of relief and modelling seldom attained. Notably a three-quarter face, or rather, five-eighths, of Adelina Patti, possessed these qualities in rare perfection, and excited universal admiration. English photographers became familiar through these pictures with the name of M. Reutlinger as that of an art photographer of unusual skill and capacity.

M. Reutlinger's studio is situated in one of the most frequented thoroughfares of Paris, the Boulevard Montmartre. Ascending many flights of steps to reach the top of a very lofty building, we find the reception-room and studio, both on one floor, and both somewhat smaller in size than is quite convenient for the transaction of a large amount of business in portraiture. At the time of our visit we find the *salon* crowded, and the prominent feature of interest in the shape of specimens are cabinet portraits, which are displayed in profusion. Here, as in his cards, we find fine taste in posing, admirable lighting, and great delicacy, richness, and vigour. The photography was, in short, excellent, and in most respects the artistic qualities were very fine; there was but one drawback in our estimation, and that consisted in the use, in some cases, of scenic backgrounds in which painted columns, painted vases, and painted curtains were found in odd and incongruous juxtaposition. It is true that the objects were not sharply pronounced, the whole of the background being kept tolerably quiet and unobtrusive. When we first examined these backgrounds we consoled ourselves with the notion that want of skill and taste in the production of such things was not confined to England. In the course of conversation with M. Reutlinger subsequently we were disillusionized in this respect, as we learnt that the backgrounds in question had been received from London! In the later examples of his work which we have seen they have been abandoned. Recently in cabinets, as formerly in card portraits, M. Reutlinger has devoted himself considerably to the production of vignette heads, a style in which he is very successful in securing singularly fine modelling and relief, and great brilliancy and vigour without sacrifice of delicacy.

On introducing ourselves to M. Reutlinger, we meet with a very kindly and cordial reception. After a few minutes' conversation, the demands upon him by sitters compel him to leave us, with a request that we will occupy ourselves for a few minutes with the specimens, and he will then show us his studio.

M. Reutlinger is a German by birth, and has not been many years, we believe, in Paris; but he has rapidly made his mark there. Of a bright, active, genial temperament, he is quick, impulsive, and courteous in manner, rapidly going through all his work. He poses and arranges every sitter himself, and seems, moreover, to keep an eye upon all other departments. Now he is for a moment in the reception-room answering a question; then in the dark-room examining a negative—filling up the brief intervals between one sitter leaving the atelier and another being ready to sit; but never neglecting the principal occupation of attending to the sitter. A clever photographer and skilled artist, M. Reutlinger is also, we conceive, a prompt, active man of business, a circumstance of no light importance where large transactions in publishing portraits are carried on.

We now enter the studio, which is of the pent-house or

lean-to fawn, lighted from the north side only. The room is about thirty feet long, and less than twelve feet wide. The roof, like that of Adam-Salomon's studio, is of ground glass, the side light, which is eight feet high, descending to within two feet of the floor. Three feet and a half of the lower portion of the side light are of ground or stippled glass, and four feet and a half of the upper portion clear glass. This is the only clear glass in the studio, and when we were present only a space of ten feet laterally of this was uncovered by curtains. The lower portion of the side-light being partially obscured was a matter of necessity rather than choice, the intense reflection of sunlight from windows at the opposite side of the street entering the studio and proving troublesome until a portion of the side-light was obscured. Although the studio is lighted from one side only, no reflecting screens are used, the expanse of soft top-light through ground glass sufficiently relieving the shaded side of the face from blackness.

Whilst we are looking on, M. Reutlinger proceeds to pose and arrange a group of two persons, for which, by the way, his studio is not so well suited as for single figures. The group consists of a tall English gentleman and a lady, and the task is not an easy one. The gentleman is a little angular and stiff, as well as tall, and he has bright-red hair and whiskers. He manifests evident distaste to the application of powder to his whiskers, which M. Reutlinger feels it necessary to make. The lady being petite and the gentleman tall, of course the latter desires to stand and allow the lady to sit, and he is with difficulty persuaded to seat himself and allow the lady to lean upon his shoulder. M. Reutlinger perseveres, however, with good-humoured tact, and succeeds in getting a tolerably easy pose. His perceptions are quick, and all his actions rapid and lively, and pervaded by a pleasant, cheery manner. He manifestly feels the necessity of getting through his work, as there are several sitters waiting; but this induces no slovenliness or lack of fastidious care. Two card negatives of the group having been obtained, one of which is pronounced satisfactory, a gentleman next sits for a cabinet, and two good negatives are rapidly secured. M. Reutlinger, who has maintained a lively conversation at intervals between each exposure, now requests us to sit for a card vignette. The arrangement is rapidly made, and four exposures in succession are made on one plate. The negative does not quite satisfy M. Reutlinger, but we decline to trespass longer upon his time on that occasion. His chemicals are not working quite satisfactorily, a tendency to pinholes and hardness being present, which occasions some anxious communications between M. Reutlinger and the assistant operator in a very small dark-room opening out of the studio. We note that the exposures seem long—we sat thirty-five minutes. M. Reutlinger remarks that the chemicals are not in the best order; that with the very excellent lens he was then working—the No. 2 B of an English maker—his exposures were generally rapid; but that he, as well as photographers generally in Paris, usually gave fuller exposures than English portraitists seemed to think necessary.

M. Reutlinger believes it to be the duty of the portraitist to make the best of his work, and he generally works upon the negative, sometimes slightly, sometimes to a great extent. All the negatives we saw were more or less retouched, a lead-pencil having been used, deep shadows being softened, wrinkles modified, &c. The negative was treated with a solution of gum whilst wet, and the surface so obtained affords an excellent "tooth" to the pencil when dry, and renders effective retouching readily possible. After retouching the negative is varnished.

The work chiefly in hand whilst we were present consisted chiefly of cabinet portraits; but amongst the specimens in the reception-room were many exceedingly fine large portraits, some of which were apparently from negatives elaborately stippled, the delicacy, modelling, and rich chiaroscuro of which were very effective indeed. White draperies were common amongst the specimens, and always

managed with great skill; no chalkiness, no masses of white without detail and texture, ever being present.

In the cabinets a variety of scenic backgrounds were used, half-a-dozen different kinds being at hand in his studio, and readily changed for use. The examples of English scenic background were, as we have said, the least satisfactory things in his establishment, and have since, we believe, been discarded.

M. Reutlinger, besides a large practice in private portraiture, publishes largely, and was one of the first to see the advantages of the cabinet picture, which he has done much to popularize. He is, we believe, very successful, and well deserves his success.

PHOTOGRAPHIC OBSERVATION OF THE ECLIPSE.

Our readers are aware that amongst other expeditions for observing the late total eclipse, and obtaining photographs from favourable positions, one was sent out by the Prussian Government—or rather that of the North German States—to Aden, of which the photographic arrangements were under the charge of our friend Dr. Vogel. His letter describing the operations will be read with much interest.

*On Board the Steamer "Carnatic," in the Red Sea, 20 deg. N. lat.
23rd August, 1868.*

MY DEAR SIR,—I am now enabled to give you an account of the results of our expedition. Our voyage proceeded without any danger, and the weather being extraordinarily favourable, we had a calm sea; but nevertheless, we were not spared the sufferings generally imposed on the traveller who passes through the Red Sea at that hot time of the year. This sea, enclosed on both sides by deserts, and connected with the Indian Ocean only by a very narrow channel, forms an isolated bay, where, in consequence of the customary calms and want of currents in the water, the temperature increases in the same degree as you advance towards the south. The perspiration flows down your body just as if you were in a steam bath; the whole of the skin is heated and irritated, and happy is he who finds a spot on deck where a slight breeze cools him for a moment. We were glad to reach the more airy ocean, and anchor near Aden on the 2nd of August.

The aspect of this town is not in the least an agreeable one. You see a quite bare, savage mass of rocks, interrupted by some works of fortification, warehouses, shops, and coal sheds. This was the exterior of the town, where we were obliged to stay for about a fortnight. There was not a bit of green colour in the whole nature. Amongst the screaming and roaring Arabian crowd, our baggage and we ourselves were put on shore. Here we learnt that the English Government had received our friends who had arrived before us in a most obliging manner. We were shown to their station on the east side of the peninsula, where they occupied two Indian huts, called "pungaloes," which are general in that climate. There we found them, together with the members of the Austrian expedition (Messrs. Oppalzer, Riha, and Dr. Weiss), established with as much comfort as may be expected on that bare shore. The English Government proved a very generous host. A whole attendance, cook, &c., waited upon us; ears, camels, and asses were placed at our service. We were quite at ease. The temperature (26° F.) was low in comparison to that of the Red Sea. A fresh breeze was to be felt at the summit of Marshaghill, where our pungalo was situated.

In the above-named members of the Austrian Expedition I found three gentlemen of the most amiable character, and of great scientific knowledge. One of them, Dr. Weiss, is the first who called the attention of scientific Europe to the great importance of this eclipse of the sun, and has therefore induced the governments to despatch expeditions.

The heat was supportable as long as we were not at work; but as soon as we began the slightest exertions, the discomfort was very great.

We had still ten days for our preparations for taking the eclipse. They were spent by fixing our photographic telescopes, placing them, and taking exact informations. Our observatory was a pungalo, the roof of which had been partly removed in order to give way to the telescope. The remainder of the cottage served for studio, store, and cleansing-room.

This bird-eage of reed (for nothing else it was) afforded sufficient protection from the wind, but not from the dust. Water was carried up to us in leather bags. Two tents, which we had carried along from Europe, were employed as dark rooms. Some apparatus for landscape and portraits served for taking some landscape and anthropological views, and offered at the same time an apt means for trying our chemicals. Some slight faults of the latter were soon mended, but it was difficult to protect them from the influence of dust and evaporation. The least exertion drew forth perspiration in currents; it was flowing down from the fingers and faces, and it often happened that a newly-polished and prepared plate was spoiled by a drop falling down upon it. Experience, however, taught us how to avoid even this.

We tried successfully to take some views of the sun, and could expect the day of the eclipse without fear. Only one thing was not quite sure—the weather. All accounts about Aden had induced us to expect a serene sky; we had been told that rain very seldom fell, and that clouds scarcely ever appeared. We were therefore utterly disappointed when, on our arrival, the summits of the volcanic rocks were covered with clouds, and a shower of rain fell down the next morning. Our disappointment increased when, day after day, the sunrise was concealed by clouds, and the weather became worse and worse instead of better. Our prospects were bad enough, and soon all hope vanished.

At the day of the eclipse we rose at four o'clock in the morning. Nine-tenths of the sky were clouded, and resignedly we began our work. It was the task of the North German expedition to take a photographic view of the eclipse during its totality. For this purpose we had a long telescope with a lens of six inches, without difference of focus, and with a focal distance of six feet. This lens, constructed by Steinheil, afforded a solar image of three-quarters of an inch in diameter, which was taken upon a photographic plate by means of an ordinary sliding chest for two images. As sun and moon appear to be in motion, such an instrument would naturally afford images of no sufficient sharpness if it were motionless. Therefore the telescope was moved by a rackwork exactly in the same measure as the stars. In order to avoid shaking the telescope, the trap-door of the objective was not in immediate connection with the telescope, but supported by a separate foot, and communicated with the telescope through an elastic coupling hose.

The totality of the eclipse at Aden was about three minutes long (in India five minutes); nevertheless, we had chosen Aden for our station because there were already photographic observers in India, and because the totality appeared at Aden about an hour earlier than in India. Therefore a comparison of the different results would enable us to decide the question, if the protuberances appearing at a total eclipse of the sun were changing in the course of time or not.

Our task was now to get within these three minutes as many views of the phenomenon as possible. For this purpose we had exercised ourselves in the employment of the photographic telescope, like artillerymen with their guns.

Dr. Fritsche prepared the plates in the first tent, Dr. Zenker put the sliding chests into the telescope, Dr. Thiel exposed, and I myself developed in the second tent.

We stated that it was possible in this way to get six images (three plates of two images) during three minutes.

When the decisive moment was fast advancing, the sky, hitherto covered with clouds, showed some openings, through which the sun, already covered partially by the moon, was to be seen. The landscape around was illuminated by the strangest light, a medium between moon and sunlight.

The chemical strength of light was exceedingly weak. A proof plate gave a wholly exposed image of the cloud after fifteen seconds. The sun crescent became smaller and smaller, and the opening in the clouds seemed to increase.

The last minutes before the totality (which began at twenty minutes past six o'clock) went rapidly away. Dr. Fritsche and myself crept into the tents, where we remained, consequently we have seen nothing of the totality. Our work began; we exposed the first plate five and ten seconds, in order to know what was the just time.

Muhammed, our black servant, brought the first attempt into my tent. I poured the iron developer over the plate, eager to know what was to come. At this moment my light was extinguished. I called for light, but nobody heard me, as all were about their task. I stretched my right hand out of the tent, holding the chest in the left, and happily caught a small

oil lamp, which I had previously prepared at all events. And now I saw the image of the sun appearing on the plate. The dark margin of the sun was surrounded by a series of peculiar elevations, the other side showed a strange hook; the phenomenon being exactly the same in both views. My joy was great, but there was no time for enjoyment. I soon received the second, and, after another minute, the third plate. "The sun is coming forth!" exclaimed Dr. Zenker. The totality was over. All this seemed to have been done in a moment.

When I developed the second plate I perceived only very weak traces of an image. The clouds had veiled the sun at the very moment of the exposure. The third plate gave two brilliant views, with protuberances at the lower margin. Glad to have reached so much, we washed, fixed, and varnished the plates, and immediately took some copies on glass, which were to be despatched to Europe separately.

I here give you a design of the plate; a more exact drawing will be published afterwards. Over the margin of the sun we see the protuberances (*a b*); on the opposite side we perceive



the strange hook already mentioned. Its height was about one-fourteenth of the sun's diameter, and it would therefore in reality be 12,000 miles high. On the third plate we got the protuberances (*d e*) at the lower margin. After some time a more special description of the views, a comparison with those of the French and English expedition, and the results drawn from them, will be published.

How much we were favoured by fortune in our work is to be seen in the circumstance that at another point, situated at a distance of half a hour from our station, there was nothing to be seen of the total eclipse, the clouds hiding the sun during the eclipse.

Having thus performed our chief task, we had no cause for longer staying at Aden. Therefore we packed the telescope, watch, and other innumerable instruments and chemicals, loaded them on camels, and got them transported to the port. On the 21st of August we bade farewell to the bare shore, and set off for Suez.

I close my account with some photographic experiences which I made at Aden, in regard to the rapid evaporation of the ether, and the difficulty of managing etherial collodions in a high temperature, in further regard to their easily decomposing. In connection with iodides, I had prepared a collodion containing only cadmium salts, by dissolving—

Maun's gun-cotton	...	...	...	2 parts
Alcohol	...	...	...	80 "
Ether	...	...	...	20 "

After three weeks' settling, the bulk was decanted, and immediately combined with the iodides, consisting of—

(a) Iodide of cadmium	...	...	...	18 parts
Alcohol	...	...	...	270 "
(b) Bromide of cadmium	...	...	...	17 "
Alcohol	...	...	...	270 "

Two measured parts of the first solution were mixed with 1 part of the second solution and 9 parts of plain collodion. A plate prepared with this collodion immediately after settling showed streaks and a weak veil. A collodion prepared at the same time, and containing more ether—according to my ordinary formula—gave plates without any fault. Therefore I added 2 ounces of ether to the collodion. It was so rapidly absorbed, that in consequence of the absorption of the very vapours of the ether there was a vacuum after shaking the bottle. The additional ether gave very fine results, since after twenty-four hours we got plates without any streak or veil.

The bottles containing the collodion were luted by a mixture of sulphur and brick powder; a cement which prevents etherial fluid from evaporation in high temperature. There was, how-

ever, the drawback that some portion got into the bottles when they were opened, and that, in consequence of this, new decanting was necessary.

The English collodion brought to Aden by Dr. Fritsch was closed by india-rubber, which proved to be much better. They contained excessively more ether, and soon became yellow, and gave streaks very readily, and, what was worse still, dry spots.

The above-mentioned collodion proved to be free from any of these drawbacks. I developed some plates a whole quarter of an hour after exposure, and, in spite of the high temperature, I received faultless images free from dry spots. Even after weeks, the collodion was colourless. The opinion that collodions with cadmium salts give dry spots seems therefore, to be erroneous. The chief cause of that phenomenon is perhaps to be found in the amount of ether and in the quality of the gu-cotton. The above-mentioned collodion was not only employed for our astronomical views, but also for landscapes and portraits, and always proved equally good. In order to prevent the collodion from being spoiled by the dust, the collodion flowing from the plates was received into sundry bottles.

The silver bath employed was an 8 per cent. solution, containing some nitric acid.

The developer consisted of—

Sulphate of iron and ammonia...	...	7 parts
Acetic acid	...	5 "
Plain water	...	100 "

The intensifying bath contained—

Nitrate of silver	...	2 parts
Citric acid	...	3 "
Water	...	50 "

which, when used, were mixed with some parts of the above developer.

In the torrid zone we are obliged to employ an acid silver bath, an acid developer, and an acid intensifying bath, if we want to get good results.

I will shortly send you the account of some other experiences.—Yours,
HERMANN VOGEL.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XXXIV.

The arrangement of a family group is certainly one of the most difficult things to succeed well in accomplishing perfectly in photography, more difficult even than the composition of a picture that would take a much higher rank in art, but of which the materials were more under the command of the artist as regards selection and disposition. In a portrait group every face must be prominent, no figure must be sacrificed for the sake of pictorial effect, and, therefore, there can be little or no subordination, one of the chief elements of success in art. This difficulty is felt by painters who can devote time and particular attention to each figure, and who, moreover, can place his figures on different planes; but the photographer has still less opportunity of taking artistic liberties with this kind of subject, and it is only by double-printing that he can hope, in some



measure, to succeed; even then he has difficulties to contend with that will often cause him to despair of success.

West's groups of portraits of his own family, which affords this week's illustration, is a capital example of a family group. This was a favourite picture with Leslie, who says of it: "We undervalue that which costs us least effort, and

West, while engaged on a small picture of his own family, little thought how much it would surpass in interest many of his more ambitious works. Its subject is the first visit of his father and elder brother to his young wife, after the birth of her second child. They are Quakers, and the venerable old man and his eldest son wear their hats, according to the

custom of their sect. Nothing can be more beautifully conceived than the mother bending over the babe sleeping in her lap. She is wrapped in a white dressing gown, and her other son, a boy six years old, is leaning on the arm of her chair. West stands behind his father, with his palette and brushes in his hand, and the silence that reigns over the whole is that of religious meditation, which will probably end, according to the Quaker custom, in a prayer from the patriarch of the family. The picture is a very small one, the engraving from it being of the same size. It has no excellence of colour, but the masses of light and shadow are impressive and simple, and I know not a more original illustration of the often-painted subject, the ages of man. Infancy, childhood, youth, middle life, and extreme age are beautifully brought together in the quiet chamber of the painter's wife. Had he been employed to paint these five ages he would have given himself a great deal of trouble to produce a work that would have been classical, but, compared with this, common-place; while he has succeeded in making a picture which, being intended only for himself, is for that reason a picture for the whole world; and if painters could always thus put their hearts into their work, how much would the general interest of the art be increased!"

The student will by this time be able to analyse for himself the composition of this picture; I only introduce it to show what beautiful results arise from extreme simplicity of treatment. The object of the visit is the new-born child. Notice how everything is made to lead the eye to the "little stranger," especially the chiaroscuro. Observe, also, the very simple yet effective background, and the manner in which it is used to relieve the groups, the dark portion supporting the light mass formed by the mother and child, and the light, even-tinted wall throwing out the darker forms of the men. The black shoes of the grandfather and uncle play no inconsiderable part in the composition, and help to join the two groups and emphasise the whole.

Good as this picture is as an example of grouping, I would not advise the photographer to try to imitate it exactly in any group he may have to photograph, but he may allow it to guide him in the composition of a similar group. I have repeatedly insisted, and I again recommend, that the student should not attempt to imitate the works of others until he has thoroughly grounded himself in the principles of art, and knows the causes of the beauties of line and tone in good works, and these I would not have him imitate servilely. To one who has mastered the grammar of his art, and is able to originate fine thoughts, suggestions from the works of others are often useful. A notable instance of this I had the pleasure of seeing lately. When M. Adam-Salomon visited England a few weeks ago he brought with him one of the most delightful things I have seen by him: a noble boy, partly reclining on a chair, with his head supported on his hand, and with the face turned upwards. This charming portrait, of which words cannot give an idea, the artist informed me was suggested by a print after Sir Thomas Lawrence's "Master Lambton;" but although the idea was suggested by the engraving, the working out was very different, and the beauty of the photograph was the result of M. Salomon's knowledge of art and his skill in adaptation, and did not consist in the fact that he had taken this picture for imitation. In the hands of one who had no acquaintance with the rules of composition and chiaroscuro the attempt must have ended in failure as great as the abortive results of those photographers who collect a set of poses prepared for them by persons as ignorant as themselves, and fit their sitters to their haphazard.

DR. TOWLER ON THE COFFEE PROCESS.

SOME months ago Dr. Towler published the results of some interesting experiments with dry plates developed with the nitro-gelatin developer. As the results were less favourable with the coffee plates tried than Col. Baratti, the inventor of

the process, believed would have been produced by the process as first proposed, he protested against the experiments as examples of the results of his process. Mr. Jex Bardwell, an American photographer, also offered a similar protest, and as extracts from the remarks of both gentlemen were published in our pages, we now give the response of Dr. Towler, and the record of some further valuable experiments, which he publishes in our *Philadelphia* contemporary. Dr. Towler says:—

"The experiments that I made last winter in Albany, on dry plates, were executed with care, in order, as I said, to ascertain the comparative merits of three well-known dry plates, when treated with an iron developer. Now, the authors of the three processes had recommended an iron developer, and I, therefore, took no liberty with either process, excepting to substitute my favorite nitro-gelatin iron developer for any other that might have been recommended. Mr. Bardwell looks upon pyrogallie acid as the proper developer for a dry plate. This point I will not contest here, because it is irrelevant to the question; but I do not see how he can complain of me for making the experiments, and stating explicitly why I made them. The results were certainly those which I recorded. I wish Mr. Bardwell and others would make similar and more extensive comparative experiments on different dry plates, with the developer peculiar to the process, as well as with the same developer, for each process, both in winter and summer, but especially in winter, when the temperature is too cold to admit any operations with the wet process."

After some further remarks Dr. Towler proceeds:—

"I feel inclined to prefer the coffee process, when the plates are to be used within a day or two, to any other dry process; and this preference is founded on the simplicity of the process; but Col. Baratti says 'his process is much more complex.' The Colonel objects to my formula, because it is not the same as his. After all, the difference is very slight. It is my habit to transcribe all foreign formulæ into American weights and measures, because our practical photographers have no acquaintance with grammes, litres, &c.

"My transcribed formula is as follows:

Water	...	...	...	8 ounces, or 64 drachms
Coffee, roasted and ground	...	...	...	6 "
Leaf sugar	...	...	...	3 "

Now multiply each of these numbers by five, which will not change the ratio, and we have—

Water	...	...	...	320 drachms
Coffee, &c.	...	...	...	30 "
Sugar, &c....	...	...	...	15 "

But Colonel Baratti's formula is—

Water	...	...	...	300 grammes
Ground coffee	...	...	...	30 "
Refined sugar	...	...	...	15 "

Thus the difference is very slight; that is, I use one fifteenth part more water than he does. But the Colonel wants to know why I boil the mixture.

"I boil the mixture in order to get a better decoction of coffee; and, by boiling, the extra twenty parts of water are evaporated, and then the two formulæ coincide. But the two solutions, I admit, are different: my decoction is more consistent than the Colonel's infusion, and it remains to be proved whether it is better or worse than his for practical purposes. We take it for granted, there can be no objection to the use of loaf sugar, for this is refined sugar.

"The Colonel totally misunderstands my meaning when he supposes that, by moisture retained in the film, I mean dampness condensed on the plate. The plates I used were smooth and highly polished; they were thoroughly dried according to the common acceptance of the term, and there was no visible dampness on the film.

"The developer, it is admitted, is quite different.

"There was no alternative but to test the matter, in order to see whether I had so egregiously erred by making the above changes.

"I mixed the coffee solution and developers according to the two formulæ, and went to work and prepared plates *secundum artem*. When exposed, I cut each plate in two, and developed one-half with the nitro-gelatin developer, and the other with

the Colonel's developer. There is quite a difference of colour between the two sets of negatives; with the nitro-gelatine the colour is grey-black, with the other it resembles that of a tannin plate developed with aceto-pyrogallie acid. The former develops more intensely than the latter, but, upon the whole, I should prefer the Colonel's developer; its action is exceedingly smooth and uniform, whilst that of the former is slightly granular, a condition not occurring on wet plates with the same developer. The negatives prepared with the decoction of coffee are in all cases more vigorous than those prepared with the infusion, so that I have no hesitation in recommending the coffee to be boiled.

"I next compared results with aceto-pyrogallie acid and the Colonel's developer. These are so similar in every respect that it becomes impossible to desery any difference; therefore, since the results are the same, I certainly give preference to the iron developer.

"Finally, I compared result with a sulpho-gelatine iron developer and the nitro-gelatine, and found the granulation absent in the former. The negatives are grey-black in colour with the sulpho-gelatine, and the film is smooth and uniform in the development.

"All the plates used in these experiments were previously coated with a thin film of albumen; I tried some without a substratum, and invariably had trouble in retaining the film on the glass during development and fixing, and they were all dried spontaneously at a temperature of about ninety degrees Fahrenheit. It is possible that artificial drying may be beneficial, and, as the Colonel states, a *sine quâ non*. I will test this point, and give my experience.

"Finally, I think I can get a good negative with almost any of the dry plates in vogue, and I start for Niagara Falls in a few days, to work with the wet process.

"Since writing the above, I thought I would try a few plates that were prepared thirteen months ago—collodio-albumen plates. I exposed the first plate two minutes, and developed with the sulpho-gelatine developer (iron). After much coaxing and patience, I obtained an intense negative. This is a proof that the collodio-albumen plates retain sensitiveness for at least thirteen months; probably, in winter, I might have had to expose the same plate half an hour or more, to produce the same result. I exposed two more similar plates, each three minutes, and got no pictures, for the film fogged all over, and gave but a faint outline of the view in the general fog. It may be that I exposed too long, or got too much nitrate of silver in the developer, omitted something, or did something too much. Uncertainty is fatal to the dry process; the practical photographer cannot afford the slightest probability or chance of uncertainty; he must see the picture before he leaves the ground, or, at least, the neighbourhood.

SOLAR PRINTING BY DEVELOPMENT.

The Editor of the *Philadelphia Photographer* describes a recent visit to the establishment of Mr. A. Marshall, of Boston, to witness his operations in producing solar prints by development, which was done at the rate of about six per hour. Mr. Marshall, he states, contrives, on a clear day, to print his solar prints in the morning, having a lad to assist him, before his studio becomes thronged with visitors. The following is the formula:—

Take of condensed milk 12 ounces, and about 40 ounces of water; put them into an evaporating dish, and heat over the fire until brought to the boiling point; drop in glacial acetic acid until the milk is thoroughly curdled; strain off the liquid through a coarse cloth or fine wire strainer; mix up the white of one egg well with the filtrate, put over the fire, and boil once more. By the use of the egg the whole becomes perfectly clear, and can be readily put through filtering paper.

After filtering dissolve 10 grains of iodide and 5 grains of bromide of potassium in the liquid.

Silver Solution.

Of silver, 30 grains in summer, and 40 grains in winter, made quite acid with glacial acetic acid.

Developing Solution.

Pyrogallie acid	...	...	...	15 grains
Acetic acid...	...	...	...	1½ ounces
Water	...	...	...	10 "

Mode of Working.

The serum of milk is applied in the same manner as silver to plain paper; then let it dry (yet not too dry); after which tack to the solar printing-board, and silver the same as it is iodized (carefully excluding all white light). Now print until the shades of the picture are plainly seen, then brush the developing solution smartly over it. When it is as dark as desired, immerse it quickly in hyposulphite of soda, and let it remain long enough to stay the action of the developer; then take it out, rinse well in water, and immerse it in a second solution hypo, sufficiently strong to fix the picture thoroughly (say) from five to ten minutes. Sufficient carbonate of ammonia should be added to give a strong alkaline reaction. Care should be given that the pictures are taken out just as soon as fixed, and then thoroughly washed.

REACTIONS OF HYPOSULPHITES AND SULPHO-CYANIDES UPON ALBUMEN PRINTS.

MY M. CAREY LEA.*

ALTHOUGH very much has been written upon this subject, yet, nevertheless, its extreme importance may excuse a few words more upon it. There is no greater reproach to photography than the insecurity always felt as to the permanency of its productions; and this doubtful permanence we all know to be due to some action of the fixing bath. Without undertaking to find decisive solutions to any unsolved problems, it is, perhaps, worth while to put on record the result of the following experiments.

And, first, I may remind my readers that it is a well-ascertained fact that albumen is capable of entering into distinct chemical combinations with certain metallic oxides, and, amongst these, with oxide of silver. When, therefore, a sheet of paper coated with albumen mixed with an alkaline chloride is floated upon a bath containing an abundant quantity of nitrate of silver, there is formed both chloride and albuminate of silver.

Suppose, then, the fixing to have been performed in the usual manner, and most thoroughly, and also that the print has been thoroughly washed, the question arises, Is any silver left in the whites? and, if so, why? and how much?

The first of these questions has already been decisively settled. There does certainly remain silver in the whites. To obtain an answer to the other questions, the following experiments were made.

Some albuminized paper was sensitized in a 50-grain bath of plain nitrate, and was washed and fixed without exposure. Different pieces were left in the hyposulphite bath, which was a perfectly fresh one, consisting of 1 part of hypo to 4 parts of water, for different periods of time, varying from a few minutes to half an hour.

These pieces were then tested with hydrosulphate of ammonia, applied with a clean quill, and in sufficient quantity to fully produce whatever effect it was capable of. The result found was this: that although, even from the pieces left the shortest time in the fixing bath, the silver compound sensitive to light had been perfectly removed, so that the hyposulphite had in five minutes perfectly done that portion of its work, there was another insensitive compound left, which continued regularly to diminish in quantity by continuation of the action of hypo. That is, whilst the portion of paper which had been in the hyposulphite but five minutes stood a severe test of sunshine under a negative absolutely as well as a piece fixed for half-an-hour, nevertheless, the piece which had been in ten

* *Philadelphia Photographer*.

minutes gave a less brown streak with hydrosulphate of ammonia than one treated for five minutes; one treated for half-an-hour showed less indications than one treated for twenty minutes; and so on.

A prolonged exposure to the action of hyposulphite, where allowable, has therefore a very plain advantage. For that this silver in the whites has something to do with fading seems pretty clear; it would at most appear that the chemical action connected with fading starts with it.

A comparison of these results was extended to sulphocyanide of ammonium. Paper immersed in a solution of that substance (sulphocyanid-; 1; water, 2) for different periods—from five minutes up to twenty—were tested in the manner just described. The result was altogether different from that obtained with hyposulphite. The brown stains produced by the hydrosulphate of ammonia were all equally strong, and without reference to the time of action; the stain on paper left for twenty minutes was no lighter than on that left in but five.

It appears, then, that this substance is not soluble in sulphocyanide. As the pieces which had been immersed in sulphocyanide exhibited about the same strength of colour under the hydrosulphate test as the piece which had been acted upon by the hypo for five minutes, it would seem that not very much of this substance had been removed by the hypo in the first five minutes, and that the whole quantity of this compound originally in the paper was but small.

Finally, I may remark, that the extended series of experiments which I have made upon the properties and permanence of paper positives seem only to place in a stronger light the great uncertainties connected with silver printing. The solutions in use are continually undergoing changes which, whilst they are of paramount importance to the keeping qualities of the print, are invisible to the eye, and can with difficulty be guessed at. Such considerations enhance the importance of those processes which avoid the use of silver, and give the unstable compounds which silver renders it necessary to employ.

Since the above was written, I have noticed a fact which seems of interest in connection with the fading of positives.

A portion of a print was subjected, more than a year ago, to a simple sulphur toning—that is, hyposulphite of soda and chloride of lead, without any admixture of gold. This was marked and put away. About the same time a line was drawn with hydrosulphate of ammonia across the whites, which produced a brownish stain. The stain, though a decided light brown, was, of course, much lighter than the dark portion of the print. Now, after the lapse of about sixteen months, matters have materially changed. The sulphur-toned print has nearly faded out, so that the streak of sulphide is now much darker than the print.

This is an interesting fact, and one which seems fully to confirm the view which I expressed long since—that the popular idea that the fading of a print depended upon the production of sulphide of silver was erroneous. Here the print had almost faded out; whereas the sulphide of silver alongside had not (so far as could be noticed) suffered any alteration. Sulphide of silver is, in its chemical relations, rather a stable substance, and not one from which we should expect such changes.

Again, there seems another very strong reason: In a faded print the whites generally turn yellowish. If a conversion of silver into sulphide is taking place, why should that darken the light parts whilst it lightens the dark parts?

Again, in the prints in question, although the whites are fairly yellowish, they are not nearly so dark—not the tenth part—as the stain left by the sulphohydrate of ammonium. If a complete conversion into sulphide has taken place, and if such a conversion can almost efface the print, it ought to have completely affected the white also. For the reasons above given, I do not conceive that faded prints are converted into sulphide, but rather into some much less coloured silver compound.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Association was held on Tuesday evening, the 25th ult., the President, the Rev. G. J. BANNER, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. FORREST said that at a recent meeting he had promised to bring forward a new kind of dull glass suitable for focussing. He had placed a piece of the glass in question in the hands of the Secretary, and would be glad to hear his report.

Mr. BOLTON said he had tried the glass, which, in appearance, was very similar to fine ground-glass, and found that the image formed upon it would bear magnifying to a greater degree than upon ground-glass of the finest grain.

In answer to an inquiry, Mr. FORREST stated that the dull surface was obtained by the action of vapour of fluorine acid.

Mr. SLEDDON passed round a number of pictures by the quassia process, some of them taken under very unfavourable circumstances; and gave a *resumé* of the process, which, however, did not differ from the details already published.

The pictures entered in competition for Mr. Green's prize were then given in for adjudication, Messrs. A. and R. Cooko being chosen judges. The prize was awarded to Mr. Henderson, for a dozen stereos by the collodio-bromide process. Indeed, the whole of the pictures entered were taken by the same process.

Several prizes were announced for future meetings, and there is every hope that the admirable system instituted by Mr. Green will, by giving birth to a spirit of emulation amongst the members, tend to raise not only the number of workers, but also the standard of quality of results produced. In addition to Mr. Green's prize for the best year's work, there are others promised by Mr. Hughes, for the best picture not exceeding 25 square inches, and by Mr. Henderson and others, object not announced.

A discussion arose as to the advisability of having another excursion. Several rather remote localities having been named without finding favour, it was finally decided, in consequence of the unfavourable weather experienced on the occasion of the last Saturday afternoon excursion to the "Old Hut," to repeat that excursion on Saturday, the 5th of September.

The meeting was then adjourned.

Correspondence.

SUGAR IN THE PRINTING BATH.

MY DEAR SIR,—Enclosed are two photographs from the same negative: they are of no account except in illustrating a little matter.

When Bovey's formula for printing-baths appeared in your YEAR-BOOK last winter, I thought it would be a considerable benefit to me if I could prepare sensitized paper to keep for a few days. I had always been in the habit of using it immediately on preparation. Accordingly, I added the quantity of sugar recommended to my 80-grain bath, and have been using it during the spring and summer, and been well pleased with it. About seven weeks ago I left my studio for my summer ramble. On my return lately, and beginning to print, I found some sensitized paper left from my last printing. It was not a good colour by any means, but I printed, toned, and fixed a few cartes, and No. 1, enclosed, is one of them. Forty-five days elapsed between the sensitizing and the printing and toning. The colour is not good—the negative will not give that under any circumstances. No. 2 is a carte from the same negative, the sensitizing, printing, and toning done on the same day; and the colour is very little better.

Another point I may mention in connection with this. Your contemporary, the *B. J.*, in No. 423, deprecates the use of sugar in the printing bath. He says, in winter it may be allowable, but

in summer the chances are that it decomposes and becomes useless. All through this hot summer I have used sugar in this bath, having it slightly acid, as he also recommends; but my experience leads me to consider it perfectly reliable, and by no means subject to change. At the end of last week I printed six dozen cartes in the printing bath made in winter last, with the quantity of sugar recommended, and in no way can I see any difference between the cartes printed then and now.

No. 2 is one of those last printed.

September 14th, 1868.

Yours very sincerely, KENT.

[The cards sent admirably illustrate the value of sugar in the printing bath in permitting the paper to be kept, without yielding discoloured prints. Our correspondent speaks modestly of his pictures when he says the colour is not good. They are both above the average in general qualities, and are of a rich warm sepia tint—that on paper upwards of six weeks sensitized scarcely appreciably less pure in the lights than the other.—ED.]

AUTOMATIC SYPHON.

SIR,—I had not long been employed in photographic manipulations before I became convinced that an *automatic syphon* would be of the greatest service to photographers and all others using corrosive fluids or valuable metallic solutions.

At the first glance the construction of such a thing as a really automatic syphon appeared to me (as it perhaps may, sir, to you) an impossibility; but four years persistent endeavours have enabled me to surmount the difficulty, and to produce a syphon so perfectly automatic that it may be used to transfer prussic or boiling nitric acid, and so simple that it can be made more cheaply than a syphon of ordinary construction.

Photographic apparatus makers to whom I have offered the invention are some of them of opinion that such a thing would not be of any use to photographers, whilst others express their belief that, however useful it might be, the greater number of photographers would be "too mean" to purchase it.

Some of these gentlemen, however, appear to be getting so good a living out of their "moan" patrons that I am induced to appeal from the makers of apparatus to the users thereof, and to beg of you, sir, to allow your readers an opportunity of judging for themselves as to the probability of their finding a use for such an article, and of expressing for themselves their unwillingness to invest a sixpence in its purchase.

Judging from my own experience, there are, I believe, many assistants who would, if necessary, spend such a sum from their own pockets to possess the means of emptying a large positive bath without risk or trouble.—I am, sir, yours truly,

JOHN SMITH.

9, Rue Royale, Boulogne-sur-Mer, France, Sept. 10th, 1868.

Talk in the Studio.

THE ABYSSINIAN EXPEDITION.—We are glad to learn that Serjeant John Harrold, late chief photographer to the Abyssinian expedition, was one of the six non-commissioned officers of the Royal Engineers to whom was awarded silver medals for "distinguished services in the field" before Magdala. General Simmons, C.B., distributed the decorations at a full-dress parade of the corps at Chatham on Saturday last, and in his speech made special mention of Serjeant Harrold, whom he complimented on the efficient manner in which he had discharged his photographic duties.

PORTRAITS OF THE ABYSSINIAN PRINCE.—We have received from Mr. Jabez Hughes, of Ryde, a series of very admirable portraits of Alamayou, the young Abyssinian Prince, and of his attendant, Kassa; also of Captain Speedy, in his Abyssinian costume, to whom the little Prince has especially attached himself. All the portraits are technically fine, and where groups have been taken we have some exceedingly fine pictorial effects. We have the little Prince in various forms of native costume, and also in European costume, all good, and admirably rendering the semi-Egyptian, semi-negro type of features. The

attendant, Kassa, although black, possesses features of a fine, straight, European type.

HARNECKER'S DRY COLLODION.—We learn from M. Romain-Talbot that Mr. Solomon, of Red Lion Square, has been appointed London Agent for Harnecker's Dry Collodion, to the value of which reference has recently been made in our columns. We hope shortly to have something to say on the subject. Mr. Solomon is also agent for the Carrier Sensitive Albuminized Paper, which has, we are informed, been reduced in price and improved in quality.

TEMPORARY VARNISH FOR NEGATIVES.—Many negatives only require to be used once or twice. In order to protect them, they may be coated with a temporary varnish, made, viz.: Take 4 ounces of white glue and dissolve it in 4 ounces of acetic acid, add a pint of water, and, when properly mixed, it is ready for use. Coat the plate as with collodion. It is easily washed off, and saves much time and trouble.—*Philadelphia Photographer*.

THE AMERICAN BROMIDE PATENT.—It is estimated that if a renewal of the bromide patent had been obtained, the photographers in the United States would have been taxed during the seven years of its continuance to the extent of 1,750,000 dollars, or nearly £350,000 sterling. It is estimated that there are 5,000 photographers in the States. It was the intention of the patentees to impose a licence, costing 10 dollars a year (about £20), upon such studios as they considered first class, and 50 dollars on those regarded as second class. The above estimate of taxation is calculated in the second class rate for the whole.

WAXING THE PLATE-HOLDER, &c.—A correspondent of the *Philadelphia Photographer* says: "I use pure beeswax to protect my plate-holders from the action of the silver solution. Warm them, and rub it in with a piece of wash leather. For mounting photographs I dissolve equal parts of bonnet glue and gum arabic in enough water to secure the consistency of maulage; strain through muslin, and, when cool, it will be about right for hot weather, but in cold weather it must be warmed. A few drops of alcohol will keep it from changing. It sticks, dries quickly, and leaves the cards elastic, and not apt to curl." [This mixture has already been described in our pages by Mr. Spiller.—ED.]

To Correspondents.

G. H. M.—There are two French photographic journals, "*Le Moniteur de la Photographie*," edited by Mons. Ernest Lacan, published fortnightly by M. Lieber, 13, Rue de Seine, Paris. You can obtain it direct from the publisher for twenty francs per annum. The "*Bulletin de la Photographie*" is the organ of the French Society, and is issued monthly to members of the Society. It contains the proceedings of the Society, and other matters; the subscription is fifteen francs a year; the publisher, M. Gauthier Villars, 55, Quai des Grands-Augustins, Paris.

YENDIS.—The plan of your studio seems to be very good indeed, and we do not see any need for modification of the plan already laid down. It is probable that you will not suffer inconvenience from the houses, painted white, at fifteen feet distance; nevertheless, if the distance can, without inconvenience, be made greater, it will be wise to increase it. If the walls of the passage which turns at right angles be made black, or some very dark colour, so as to reflect no light, there will be no need to have a door to the dark room. The position of the door of the studio is more a matter of convenience than of anything else; we see no objection to its present position.

W. J. A. G.—Messrs. Robinson and Cherrill's address is 1, Grove Villas, Upper Grosvenor Road, Tunbridge Wells. We have no doubt that Mr. Robinson will supply you with studies on the terms you name. The portrait of Mr. Solomon was not taken for publication; its excellence and interest have suggested that course since. Is your copy of the News sent direct from our Publishing Office?

E. L. (Cambridge Heath).—Various formulæ for printing enlargements on canvas by development have appeared in our pages. Perhaps the most complete formulæ and instructions for manipulation appear on page 138 of our Ninth Volume. We regret that the press of our imperative engagements does not leave us time for writing private answers to questions of this kind.

J. H. R.—We have not heard of or met with any tendency in the gelatino-iron developer to cause the film to split from the plate,

nor can we see any necessary reason why it should do so; except, indeed, that as a rule a little longer exposure is generally necessary with a gelatine-developer, and, when there is any trace of under-exposure, and the development requires pushing, there is always a greater tendency in the film to split up on drying. The best remedy, when the tendency is, from some unknown cause, manifestly present, is to treat the film before drying with a dilute solution of gum-water, which will generally check the tendency to split.

ADRIET.—We can suggest but one of two reasons for your gelatine solution not assuming the condition of a jelly on cooling. Either the gelatine is at fault, or you have boiled it too long, and it has assumed the character of meta-gelatine. We are assuming, of course, that you were careful to add only the proper quantity of water. To test whether the gelatine is good, soak a little in cold water. If it be good, it will swell up without dissolving; if it show any tendency to dissolve in the cold water, it is bad, and unfit for the purpose.

H. S.—We will examine the varnish and collodion at our earliest convenience. We have recently been closely engaged, and have not had much time for experimental examinations of the kind. 2. It is a somewhat dangerous expedient to endeavour to get rid of the dark shadows arising from the use of vertical light, by reflectors placed underneath. The unnatural reflection is apt to produce unpleasant effect on the eyes. Try it by means of sheets of white paper or calico before taking any definite steps. It is only by experimental essays that you can hope satisfactorily to modify your difficulties.

B. L. notices that we commend Mons. Adam-Salomon for appropriating an idea from Sir Thomas Lawrence; whereas, if he had understood the art teachings in our pages, he would have noticed that imitation of the works of others is condemned as a pernicious practice. B. L. seems to have arrived at a curiously erroneous conclusion, indicating very imperfect knowledge of the subject. The kind of imitation which has been denounced in the art articles in our pages consists in the slavish copying of common-place models, merely because they save the photographer the necessity of thinking for himself. Such a practice never leads to excellence. But we have constantly urged upon our readers the careful study of the works of great masters as affording the best possible art culture. One of the chief aims of Mr. Robinson, in his lessons on Pictorial Effect, is, besides teaching some principles, to bring under the attention of the student good models, and to point out in what their excellence consists. Wherever you see a good idea in a great master, seize upon it, and make it your own by understanding it perfectly. Any reproduction of it will then be your own embodiment of that idea, and not a slavish copy of it. Bear in mind that there is an enormous difference between adopting the idea of a great master, and imitating the work of unknown photographers, bad, good, and commonplace, selected and rendered by an incompetent man working with an imperfect process.

THOMAS LEWIS.—See answer above to E. L. 2. The canvas is not sold ready for photographic use. 3. If the operations are carefully conducted, we do not see much reason to doubt the permanency of the results. 4. The simplest method of printing on ivory which we know, is by using our collodio-chloride process; the formulae, &c., given in our last YEAR-BOOK, answer well.

J. T. B. (Lydd).—The chloride of silver may be removed by filtration. 2. If your bath does not decrease in bulk in such ratio as to render necessary the addition proposed, only add half the amount, or only add it every other day; but, in making the addition, keep the proportions of gold and of water indicated. 3. It is always well to keep prints moving whilst in either toning or fixing bath. 4. The method you adopt with your washing waters is right. We cannot tell you with certainty the price you will obtain for chloride of silver; if pure, you will probably obtain about a similar weight of nitrate of silver. 5. The chief advantage in obtaining the NEWS direct from the Office is a saving of time. If you get it in good time, there is no reason for changing. 6. We cannot suggest any reason why you found it required such long exposure to get an image on Niello paper, except some imperfection in the sample you used. We are glad that you find Mr. Bovey's formula so satisfactory.

DETERMINED.—It is scarcely possible that you should add to any solid substance its own weight of a solvent, and that after mixture it should remain as firm and solid as before. It is almost equivalent to saying that you poured an ounce of water on an ounce of salt, and that the salt remained as dry as at first. Nevertheless, after the solvents have been added to the melted wax, it may, on cooling, form a firmer paste than you desire; in which case again melt it, and add such proportion of the solvents as you may think requisite to produce the result you wish. Add (say) one-fourth of the original quantity of solvents, mixed in the due proportions as stated in the recipe. For our own use we prefer a somewhat firm paste; others like it in the consistency of a soft pomade. In either case, place a few patches of it over the surface of the print—say

in half-a-dozen places. Rapid friction with clean flannel will quickly spread it all over, and continued friction will produce the rich depth and polish desired.

AMATEUR.—It is somewhat difficult to make a paper print quite transparent and free from any mottled effect, because the paper itself is not quite free from mottled inequalities in texture. It is desirable, however, to soak the print well in boiling water to remove the size first of all. They may then be treated with wax, or a mixture of a wax and a resin (such as dammar) applied warm. It is possible that one of the encaustic pastes we gave last week, applied warm, so as to thoroughly saturate the print, may answer. The effect, if properly managed, is pretty. It has often been done.

SWAN RIVER.—Of the lenses you quote 3 B is the quickest with open aperture. 2. It will cover the size plate named for most subjects without stopping down. It is of the same quality and character as the No. 2 by the same maker, which you possess. 3. We cannot give you the absolute ratio of exposure between 2 B and 6 D, but the latter would require much longer—probably four times as long. 4. For a full-length standing figure of good proportions in a cabinet picture about 30 feet between sitter and camera would be required by 6 D. 5. You can best judge of the relative cheapness of the lenses yourself. If the D lens suit your purpose, it is undoubtedly a cheap lens; but if you require rapid work, you must remember that it is least rapid of those you quote. The quality of pictures it gives is admirable; and where the studio is well lighted it answers well. If you wish to use it for cabinets, No. 3 or 4 of the same series will answer better, and they all cover more than the catalogued size. We are glad that you find the NEWS so useful to you in your far distant home.

H. V. C.—Any of those you mention will serve, probably No. 1 or 3 best; but each will be better for the purpose after the addition of from half a grain to a grain of bromide of cadmium per ounce. 2. Spring water cannot be depended on for washing without a preliminary rinse in distilled water after the plate first leaves the silver bath. 3. The method described is better than redipping. 4. Much depends on the weather, and care in storing. Mr. England has kept them upwards of a month, whilst some persons do not find them keep much more than a week. 5. Unless there is mismanagement, such plates have not a tendency to crack or peel. The albumen checks such tendency, even if otherwise present.

VENATOR.—If you, as you state, carefully follow instructions whereby others succeed, and you altogether fail, it is a somewhat difficult thing to say why you fail, or to point out a remedy. Any good bromo-iodized collodion generally succeeds; but most commercial samples are better for dry plates after the addition of a little extra bromide. 2. The Liverpool Dry Plate Company's plates are exceedingly good, and may be used for interiors if they are not very dark; but some interiors require an hour or two of exposure with wet plates. You could not hope in such case to succeed with dry plates requiring at least three or four times that exposure. 3. Mr. Bovey states that he uses the double chloride of gold and sodium; an ordinary commercial sample will serve. If you follow his instructions you cannot fail. Many photographers have written to say that it is the most satisfactory formula they have used. If, from some peculiarity in your manipulation, you find the chloride of calcium formula answer better, stick to its use. 4. No. 3 will probably answer your purpose best. The rapid is the most valuable lens.

W. H. M. (Bristol).—Oil of spike is the brief or familiar term for the essential oil of spikenard, a plant of the lavender family, but different. The essential oil slightly differs from that of lavender, and is generally cheaper. It is well known in commerce, and is generally kept by chemists. If you cannot procure it, another essential oil—such as that of lavender or rosemary—will serve.

Several Correspondents in our next.

Photographs Registered.

- MR. A. BEATTIE, Preston,
Photograph of Rev. D. F. Chapman.
Photograph of Rev. Edmund Lee.
- MR. THOMAS IRVING, Cockermouth,
Two Photographs of Lord Mayo.
- MISS HARRIETT RYLANDS, Ardsley,
Photograph of Miss H. Rylands and Mr. Fearnough.
- MR. J. D. WATMOUTH, Nailsea,
Photograph of Rev. H. J. Cummins.
- MESSRS. APPLTON AND CO., Bradford,
Photograph of Rev. William Clowes.
- MR. D. B. EVANS, Newport,
Two Photographs of Archdeacon Sleeman.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Wet Collodion without Water.....	457
Obernetter's Application of the Collodio-chloride Process.....	457
Short Essays on Photography and Art. By Nelson K. Cherrill	458
Sketches of Travel from a Sun-Painter's Portfolio. By S. Thompson	459
A Rapid Enlarging Process. By M. C. Sternberg	460
Practical Hints in Working Tannin Plates. By M. P. J. Graus	461
Reproductions of Works of Art of all Countries	461

	PAGE
Pictorial Effect in Photography. By H. P. Robinson.....	462
Observations on the Carbon Process. By M. Jeanrenaud	463
The Coffee Process.....	464
Proceedings of Societies—French Photographic Society	465
Correspondence—"Lux Graphicus" on the Wing—Carbolic Acid—What is Passenger's Luggage?	466
Talk in the Studio.....	467
To Correspondents	468

WET COLLODION WITHOUT WATER.

In speaking of wet collodion without water we do not, of course, mean without the use of aqueous solutions of the various chemicals employed, but of the practice of the wet collodion process in the field without the use of washing water, leaving the negative in a state for further intensifying if, on deliberate examination after returning home, it be found necessary.

Every photographer who has worked the wet process in the field, especially if he have worked large plates, is familiar with the fact that the necessity of procuring and carrying washing water is often one of his most serious troubles, and that carrying hypo amongst his chemicals forms one of his most serious risks. And he is further familiar with the fact that even if water be at hand, and the negative have been finished, he has often, when examining the negative at leisure, felt that the only thing some charming subject required was the development carrying a little further to obtain harmony. A multitude of other reasons might be adduced to show the advantages of intensifying if necessary, and of fixing certainly, at home instead of in the field; but it is unnecessary to multiply arguments to enforce a position which the landscape photographer will admit without question.

Many photographers have for years adopted the custom of finishing at home wet plate negatives. Glycerine, or glycerine diluted with water, has generally been employed to keep the film moist, and in many cases with great success. But it is necessary here, generally, to use a little water to remove the developer of mixed iron and silver solution, otherwise fog would often be the result. One of the most common objections, indeed, to the use of glycerine in this way has been the frequent tendency to fog which plates so treated have shown, if any further development or intensification were necessary; nevertheless, the use of glycerine in skilful hands has minimized the amount of water which might be employed, and materially diminished the trouble of field-work with the wet process.

The method to which we are about to refer will, we believe, remove all risks and troubles, and will permit the photographer to dispense with washing his negative in the field altogether, whilst it will preserve the image in a condition for further development or intensification without risk. For the thorough working out of this method we are indebted to Mr. H. P. Robinson, who has worked plates 16 inches by 12 inches in the field during the exceedingly hot weather without a drop of water, in every instance with perfect success, and without in any instance having a trace of fog. The material employed is a mixture of golden syrup and distilled water in equal parts. Such a preparation for such a purpose is not entirely new; it has been used before; but in the same manner as glycerine, after slight washing, in

order to minimize the amount of water necessary, not to dispense with it altogether. A few words of explanation will be necessary to indicate the difference between the action of glycerine and that of golden syrup, and why the latter may be employed without washing the negative at all, and with perfect immunity from the risk of fog.

About three years ago, when the subject of organico-iron developers was receiving special attention, we made a series of experiments, in conjunction with Mr. Robinson, with various substances added to the developer, a record of which will be found in our Ninth Volume, on the 517th page. We then found that when the development was prolonged with an iron developer to which glycerine had been added, a tendency to fog was the general result. But when golden syrup was added, even in very minute proportions, it had a singular tendency to arrest development, the shadows being remarkably clean and transparent. The glycerine slightly aided reduction, the golden syrup retarded it. It will be readily seen, then, that if glycerine be applied to the film whilst it still contains traces of the iron solution and of the silver solution present in development, a tendency to fog will be the natural result. If, on the contrary, golden syrup be applied, development is arrested at once, and all tendency to fog prevented. Both preparations preserve the film moist, and permit the negative to be kept in that state, but the action on the image is widely different.

It is only necessary, then, in operating in the field, to develop the image as fully as appears necessary, and then apply the mixture of golden syrup and water without washing at all. Development is at once arrested, the iron and silver producing no further action. The negative is then placed in the box, where it will remain moist for hours or days. It can then be thoroughly washed and examined at leisure. If further development or intensification be required, it can be effected without any risk of fog; or, if no further treatment be necessary, it can be fixed with, in either case—other conditions being right—a tolerable certainty of an especially bright negative.

We shall be glad to learn the experience of landscape photographers with this preparation, which promises a considerable relief in field operations. Our own experiments have not been very extended, but perfectly satisfactory; those of Mr. Robinson, with very large plates under trying conditions, have been numerous as well as satisfactory, results fully confirming what theory had suggested.

OBERNETTER'S APPLICATION OF THE COLLODIO-CHLORIDE PROCESS.

WE have recently devoted some time to further experiments with our collodio-chloride process, and to Herr Obernetter's commercial application of it, in his sensitive-prepared paper. We are indebted to the courtesy of our friend Dr. Liesegang

for some examples of the materials, and details of the manipulation and formula, employed by Herr Obernetter, which have given additional interest to the experiments.

The paper employed by Herr Obernetter is described in a letter to Dr. Liesegang as follows:—"I take fine porcelain paper, coat it with glue, and, after drying, make the glue insoluble by dipping the paper in a certain solution. Then I dip this paper in a very dilute solution of gutta-percha in a mixture of chloroform and ether. This is a very disagreeable preparation, but I cannot use any other substance but gutta-percha, nor any other solvent than chloroform, or that and ether. The paper is then coated with collodio-chloride of silver."

Porcelain paper is that known in this country as enamelled or surface-paper. Collodio-chloride of silver applied on such a paper gives an exceedingly smooth, glazed, and delicate surface. The reason for the preparations it undergoes before receiving the coating of collodio-chloride is found in the fact that if it be applied to the paper in its ordinary state a number of minute bubbles are formed in the film which mar the picture. The solvents of the collodion are absorbed by the layer of pigment which coats the paper, and air being displaced in the operation causes the bubbles. The solution of glue—or, properly, gelatine—subsequently made insoluble by alum or some similar substance, will tend to make the surface non-absorbent, and will thus keep the image perfectly on the surface, and prevent the formation of air-bubbles. The object of the second coating of gutta-percha is not stated, but its intention is probably to secure adhesion of the collodion film to the paper.

Dr. Liesegang favoured us with a sample of the paper prepared for the reception of the collodio-chloride, which we tried, both with a sample of the sensitive preparation made by our own formula, as given in our last YEAR-BOOK, and by the formula employed by Herr Obernetter, of which we have yet to speak. In the prints produced on this paper as prepared with collodio-chloride by ourselves, we have found none of the difficulties which some have found with the Obernetter paper, and to which we found a tendency in the sample we tried. We refer to a disposition in the film to leave the paper during the manipulations, or in drying, or a disposition in the film when dry to crack. The prints produced on the sample of paper we tried were all good. The formula for collodio-chloride with which Dr. Liesegang has favoured us, and with which in the letter to which we have referred Herr Obernetter expresses his satisfaction, stands as follows:—

Alcohol	...	...	200 cubic centimetres
Ether...	...	...	250 "
Soluble cotton	...	...	12 grammes
Nitrate of silver	...	...	8 "
(dissolved in water, 4 grammes.)			

To this is added a chloride solution as follows:—

Chloride of lithium...	1 gramme
Alcohol	50 cubic centimetres
Glycerine	6 "

This may be roundly stated as follows: plain collodion containing nearly equal parts of ether and alcohol, with 12 grains per ounce of soluble cotton. The cotton should be good, and not too horny in character, or this proportion will be too much. We used some soluble paper prepared by Mr. Blanchard, which answered well. To the collodion, nitrate of silver must be added at the rate of eight grains per ounce, dissolved in half its own weight of water. Unless the temperature of the water is raised a little, it is difficult to dissolve nitrate of silver in half its own weight of water; but it will readily dissolve in an equal weight, and if the solvents of the collodion are tolerably free from water, this quantity will not produce any injurious result. Dr. Liesegang recommends chloride of lithium in preference to other chlorides, on account of the low atomic weight of lithium, which is 6.50, a sufficient proportion of chlorine being thus introduced to form chloride of silver by the use of a very small proportion of the lithium salt, which is also very

readily soluble in alcohol. It is added to the collodion in the ratio of one grain to an ounce, which is one grain of the chloride salt to eight grains of nitrate of silver. About seven minims of pure glycerine are to be added to each ounce, with the object of giving pliancy and toughness to the film.

We made some collodio-chloride by this formula, using a sample of chloride of lithium for which we are also indebted to Dr. Liesegang. The lithium salts are extensively used in photography in Germany, but as yet they have been used but very little in this country. The collodio-chloride gave us exceedingly fine pictures, inclining, however, with soft negatives, to excess of softness in the prints. With very vigorous negatives, it gave good harmonious prints. It will be observed, however, that no organic body readily combining with the silver is added, so that no organic salt of silver—commonly desirable as an element of vigour—is present; and by the addition of such a substance we at once gain greater depth, richness, and contrast.

We tried, therefore, a portion of the same collodio-chloride, to which we added citric acid in the proportion of 1 grain to each ounce, and coated one half of a piece of paper with this, and the other half with the collodio-chloride as first made. On exposing the paper to light, the difference in behaviour of the two samples was well marked. At first the tint acquired by each was similar—a lavender tint—but that containing the citric acid darkened most rapidly. As the tints grew deeper, that with acid acquired a reddish purple colour, whilst the other continued of a lavender tint; and finally, that with the acid rapidly bronzed, acquiring a decided green tint, whilst that without acid slowly acquired a slightly bronzed olive tint. On toning and fixing this piece of paper, the half containing acid acquired a rich deep black in the same time in which the other half assumed a somewhat weak greyish black tone.

The advantage of this citric acid was most marked, both in the increased sensitiveness and the increased vigour and rich colour of the print; but the dried collodion film, it is worth noticing, was of a somewhat more horny and brittle film than the other, although both were identical in composition, with the exception of the addition of the acid to one of them. It is probable, therefore, that where citric acid is used, a still larger proportion of glycerine might have a beneficial effect.

We have not tried a sufficiently extended series of experiments as yet in the keeping qualities of the prepared paper to enter into the question at present. As we have already recorded, the paper sent out by Herr Obernetter appears to keep well.

SHORT ESSAYS ON PHOTOGRAPHY AND ART.

No. 3.—"NORTH OR SOUTH."

BY NELSON K. CHERRILL.

I REMEMBER, a long time ago, reading an account of a very scientific experiment, to be made with an empty pill-box. It was somewhat as follows. Procure a pill-box of small dimensions, and having disposed of its contents in any manner which may seem desirable, paint it black inside; now with a red hot needle make a very small hole on one side, and with a blunt skewer make a somewhat larger one on the other side; stick a pin through the bottom of the box, and upon the point of it impale any small animal, such as a flea (humanity suggests that the victim should first be slain or rendered insensible); the lid is now to be placed on the box, and then comes the point. Carefully holding the box in one hand, apply the eye to the small hole, you will probably see nothing; but now approach a candle very carefully till the flame is quite close to the larger hole (it is exceedingly difficult to do this without setting fire to one's hair, eyebrows, &c., but that is a trifle), and when the light is "well arranged," you will see the small animal impaled on the pin in a "singularly beautiful manner." For

my own part, I prefer to think that the "singular beauty" of the animal in question would be quite as advantageously examined in ordinary daylight, omitting the blackened pill-box. Now whenever a photographer begins to assure me of his faith in south light for a photographic studio I am always reminded of the blackened pill-box and the attendant horrors of a half-stupified little animal on the point of a pin. Can anything be more exact than the parallel between the two cases? The enthusiastic south-light gentleman says, "I close all the windows with dark curtains;" the medicinal experimenter says, "Paint the inside of the pill-box black." "But then," says the photographer, "I leave one small space through which I get a beam of intense light;" that is represented in the experiment by bringing the flame of the candle close to the big hole in the side of the box. Also the sufferings of the wretched flea while roasting in such close proximity to the candle, in the pill-box episode, are an exact type of the horrors of a sunlit studio, where an almost unbearable temperature reigns throughout the summer months, to the untold discomfort of the unhappy sitters. But mark, I pray you, the conclusion of the whole matter. It must be left to each person's judgment to decide whether, under these distressing circumstances, the poor little wretch under examination looks really more "singularly beautiful" than when viewed in the way in which ordinary men would view such a creature. For my own part, as I have already mentioned, I do not like the pill-box plan of examining insects, and still less do I like the pill-box plan of taking portraits. No doubt it is very scientific, much more so than any other plan; but then science is not the foundation for portrait photography, but art is, or—perhaps more accurately—should be.

There is no worse plan of aping to be great than being mysterious; and there is certainly no worse plan of being mysterious than that of pretending to do something grand when there should be in fact nothing at all to do. A well-arranged studio should have the light always right; in fact, it should be quite impossible to have it wrong at any time; the skill of the photographer should consist, not in arranging window blinds, but in posing the sitter; not that some slight alteration of light may not be of advantage sometimes, especially when turning from one style of picture to another, as from vignettes to whole-plate pictures, for instance. The amount of attention which the light requires should occupy only the fraction of a minute, while the sitter should be ever in the chief thought of the operator; and that is the very worst form of studio in which every square inch of glass surface needs to be as much thought of as the sitter. But few photographers as yet know how to manage their sitters, much less their light and their sitters.

I do not, of course, wish for a moment to deny that very clever men may produce excellent work in the studio when it faces the south instead of the north. But what clever men can do, and what ordinary men do, are—perhaps fortunately—two very different things.

"Some effects, however," it may be said, "can be produced by south light better than by north." What a charm there is in that word "some"; change it rather, and the word is *sun*, for—only excepting the effect of direct sunlight—there is emphatically no effect of lighting which cannot be produced by north light; and as to the comparative comfort of two studios, one in which the sun strikes direct on the glass, and the other in which glass is only presented to the north sky, it is only necessary to try: "One trial proves the fact" that the north light will win the day.

If, then, comfort, convenience, and common sense are in favour of the north light being used, why are not all studios made so as to give this most desirable arrangement? It is pleasing to find that where so much is to be said in favour of the northern aspect of the studio, so many of the best photographers, both at home and abroad, have adopted it in favour of any other. If Salomon's force and Rentlinger's softness can both be done with a north light, what else cannot be done that is worth the doing?

SKETCHES OF TRAVEL FROM A SUN-PAINTER'S PORTFOLIO.

BY S. THOMPSON.

No. 4.—FLEMISH CITIES.

"In the market-place of Bruges
Stands the belfry old and brown."

—Longfellow.

Bruges and its Belfry.—Time has dealt hardly with the Liverpool of the middle ages. Its harbour is no longer crowded with richly laden argosies from Venice, Genoa, and the far East. Time was when chartered companies of merchant princes from seventeen kingdoms dwelt within the walls of Bruges, and its court was crowded with foreign ministers, and men of eminence in science and art from all parts of Europe. Its river is now no longer navigable, being almost absorbed by canals for small craft, appropriate to its fallen fortunes. Its population is less than one-sixth in number to what it once was; consequently good dwellings may be had for almost nothing, and not a house has been built in Bruges for more than a hundred years. Yet there is no air of ruin or decay about Bruges. Speculative builders were not in those days. The public buildings are well preserved, and afford, like all the chief towns in the Low Countries, fine subjects for the camera. Belgian Gothic retained its purity to a very late period—with one exception, later than any other. It has also peculiar claims. Belgian Gothic exhibits, more than any other variety, the Gothic style applied to other purposes than ecclesiastical or sacred buildings. The town halls or *hotel de villes*, and other civil or domestic edifices, in which Belgium is richer than any Continental state, are subjects specially adapted for successful photographic rendering. The clean well-kept streets of Bruges and its pleasant walks only indicate, by the sparseness of the population, the absence of all commercial activity. Southey's lines embody an accurate word-picture of Bruges as it now is—

"Fair city, worthy of her ancient fame!
The season of her splendour is gone by,
Yet everywhere its monuments remain:
Temples which rear their stately heads on high,
Canals that intersect the fertile plain
Wide streets and squares and many a court and hall
Spacious and undefaced—but ancient all,
When I may read of tilts in days of old,
Of tournaments graced by chieftains of renown,
Fair dames, grave citizens, and warriors bold—
Which of such pomp fit theatre may be
Fair Bruges! I shall then remember thee."

The *belfroi*, or belfry, makes a good photograph from the Grande Place, but the view of it from the canal, taken earlier in the day, about noon, when the light is "on the turn" (with a wide-angle lens), makes a picture. Associations blended with our own past, and memories of surpassing interest, are crowded around and beneath the shadow of that old Gothic tower, and lend an additional zest to the quiet beauty of the scene. The chimes (carillons) are the finest in Europe, and their music recorded the flight of the hours with the same dreamy, unobtrusive melody, while the Van Ecks were painting their imperishable works, as long ago as the fourteenth century, as they do to-day. Those walks around once glittered with the splendid costumes of the courts of Charles the Bold and the powerful Dukes of Burgundy, the ancient Counts of Flanders, the swarthy cavaliers of Medieval Spain, and the knights of the once-famous order of the Golden Fleece, established at Bruges in the fifteenth century by Philip the Good. We must fain pass over all this, and much more than this. Is it not to be found in the chronicles of Froissart and the book of Murray? One episode only which helps to fill up a gap in our own history may I linger over and attempt to broadly sketch.

Time—the great scene-shifter to the world's drama—presents many spectacles on the same stage. The accessories are somewhat altered—new dresses and differently-fashioned costumes provided, as well as fresh actors and a new star—

but the background is often substantially the same. Before it they come and fret their brief hour, and give place in their turn to others. Now it is a comedy, now a heavy piece, and, not unfrequently, a terrible tragedy that is enacted. After long periods the scene of action generally altogether changes: the old arena decays, and is deserted. The scene changes in locality as well as in events, and heretofore unimportant places grow up to be the stage of great things in the world's history.

The waves of time had engulfed two centuries since Charles the Bold was laid in the aisle of the choir of the Church of Notre Dame; the old beffroi still rings out its carillons with wildering sweetness in the clear night air, when the curtain rolls up once more. This time the background is Flemish, but the figures are English. From a house (which still bears the Royal Arms of England, and is little altered) in the Grande Place, or Market Square, almost beneath the shadow of the old tower, might be heard snatches of roystering cavalier songs, the noise and clink of glasses, the loud jest and louder applause, floating out on the stillness of night. This was the residence of the *Merrie Monarch* Charles II., not yet enjoying his own. This was the "Over the water to Charlie," and what it meant. Here was passed some of the long years of exile, and hither repaired the loyal, the disaffected, the ruined patrician, the proscribed royalist, bringing news elevating or depressing of the state of things at home; here they sang their Jacobite songs and cavalier roundels far into the "sma' hours," and then, joining arms with the witty king, who never said a foolish thing, sallied out from the festive board to cool their heads in a saunter round the old Market Square, awakening the quiet burghers with the noise of royalist songs sung with nasal twang to the tune of Puritan canticles, the generally expressed burden of which was a desire to see "Old Nick gae hame wi' Charlie's foes before him."

Cherie, volatile, and goodnatured, a young man of some twenty-five summers, Charles won the hearts of the honest burghers, and they elected him King of the Company of Cross-bowmen (*Roi des Arbalétriers*).

He mixed freely with them, and when funds run low—which they often did—found some of them generous enough to discount his apparently almost worthless paper. Many an old burgher, as he sat in front of his quaint gabled house smoking an evening pipe, watched the gay prince trip lightly along, heeding every pretty face, for which same, Bruges was famous then as now, and thought the Stewart had small chance of ever enjoying his own again. And, indeed, appearances were all against it. Cromwell was at the full meridian of his power, and England, under his strong rule, was making herself feared and respected, both on sea and land, in a manner to which she had long been a stranger. So years passed on.

A glance at what was doing in the world of art at this period is interesting. Rubens was just dead. His great pupil, Vandyke, possessed of a more delicate physique than his robust master, followed him one short year after, prematurely old at forty-two. But nearly all the great names of the Dutch and Flemish schools were then simultaneously engaged in painting those works that are household names to us, and every fresh dispersion of which draws crowds to Christie and Manson's to offer prices that would fairly take away the breath of the painters who executed them. Teniers was painting in a quiet street in Antwerp. Rembrandt at Amsterdam, together with Van Ostade, Brauer, Gerard Douw (formerly Rembrandt's pupil), and young Paul Potter—some twenty years their junior—happily oblivious of how short was to be that career of his which closed at the early age of twenty-nine. Cuyp, born in the same year as Rembrandt, was quietly painting at sleepy old Dortrecht on the banks of his favourite Meuse (which he never could be induced to quit, save for an occasional visit to his contemporaries in the neighbouring city of Amsterdam) things which he could scarcely have dreamed would ever make the noise in the world they have done.

Wouvermans was at Harleem, which he never quitted. Claude, and Nicholas Poussin were then at their busiest periods; and a glance at Spain shows that Salvator Rosa and Murillo—a few years younger—were also hard at work, presenting altogether a galaxy of talent seldom flourishing at one time.

Time rolls his ceaseless course! Two or three revolutions of his wheel had taken place, and things seemed little changed. But one day there was great commotion and a great packing of portmanteaus in the old house in the Market Square. Messengers had arrived with weighty tidings. Cromwell was dead! The well-known events recorded in history had taken place. The old house was quickly deserted, and the belfry chimes sounded never more upon the royal ear of Charles II., of Great Britain and Ireland King.

A RAPID ENLARGING PROCESS.

BY M. C. STERNBERG.*

The continuation of fine weather we have recently experienced has, no doubt, called to mind to many photographers the fact of their having stored away in some out-of-the-way corner an enlarging apparatus of some kind or other, which might at the present season be employed with very great advantage. At the same time, the necessity of having to make a choice among the many known processes often causes them to pause. To those who are already acquainted with a good working method I would counsel to keep to the same; but to others, who desire to be informed of a rapid and reliable process, I can recommend the following with a good conscience. It is by no means new, but to whom it belongs I am unable to say, although I believe it was first practised by M. Selbach; it may, however, be relied upon to give excellent results.

The operation of enlarging by this method is so quick, that with negatives of ordinary intensity an enlargement of not very large dimensions may be obtained without any movement of the mirror during the process. The paper is coated with a sensitive material compounded of the following ingredients:—

Rain water	...	...	1 litre
Brazilian tapioca	...	...	20 grammes
Iodide of potassium	...	...	10 "
Chloride of potassium	...	...	40 "
Lemon juice	...	...	250 drops.

The tapioca is softened in a small quantity of cold water, and then added, by degrees, to the other materials which have been previously dissolved in the litre of rain water, and boiled together in a porcelain dish; the heating of the liquid must be continued during the addition of the tapioca, and so long afterwards as is necessary to clarify it. When perfectly cool, the preparation is laid upon the paper by means of two pieces of sponge in the manner suggested by Dr. Liesegang in his instructions for the production of arrow-root-paper.

When exposed to the atmosphere the paper rapidly assumes a reddish tint, and streaks sometimes become visible upon its surface; these faults disappear, however, on sensitizing the material. The last-named operation takes place in the dark, the paper being treated in a bath made up according to the undermentioned formula:—

Rain water	...	...	1 litre
Nitrate of silver	...	...	60 to 100 grammes
Citric acid	...	...	5 "

The softer the negative the more silver should be employed, and the harder the less quantity.

The exposure is continued until the outline of the picture to be copied appears upon the sensitized paper, when the latter is at once developed in a solution composed of 1 part of a saturated solution of gallic acid to 4 parts of rain water.

* *Photographisches Archiv.*

The picture is then immersed in the liquid, and will be found to become gradually more vigorous, and to assume a dark-brown tone. It should be raised by the edges now and then for inspection, and, as soon as it appears to be sufficiently vigorous, taken out and floated upon clean water, to prevent the gallic acid from impregnating the paper; after a few minutes the picture may be wholly immersed in the water and well washed, and then passed into an old gold-toning bath, and finally fixed in the ordinary manner.

After retouching, the prints are either polished or varnished, to impart a greater degree of brilliancy.

PRACTICAL HINTS IN WORKING TANNIN PLATES.

BY M. P. JOHANN GRAUS.*

HEREIN I beg leave to communicate a few details of the manner in which I operate with tannin dry plates. The principal conditions of success are :—

1. *A collodion film which has been properly applied, and is perfectly adherent to the glass.* The choice of a good tenacious collodion is here an important consideration. Among those with which I have experimented, I have found Dr. Szekely's thick body collodion the most suitable; that of Kleffel gave less satisfactory results in its application to the glass. To render the film more adherent to the glass, I roughened the surface of the plates at their extreme edges by means of a sharp stone. Care must be taken not to allow the formation of air-bubbles in the collodion, as they invariably give rise to comets or circular spots on the application of the developer.

2. *Ample washing of the sensitized film.* I place the plate in a horizontal water bath filled with rain water, and afterwards incline it in a sloping position under a rose of ordinary water for the space of about three minutes; for the latter operation the use of distilled water appears to me unnecessary.

3. *Uniform action of the tannin solution.* The washed plate is well drained, and placed edgewise for a minute or two upon blotting-paper; the tannin solution is then poured on and off the plate several times before it is allowed to remain on for any length of time; or a better plan is to place the plate in a porcelain dish containing the solution, and to tilt the utensil backwards and forwards for about thirty times, allowing the negative afterwards to remain quietly in the solution for two or three minutes, when it is taken out, and, after rinsing with fresh water, drained and dried. In those parts of the plate where the tannin has not acted uniformly, dark streaks or stains will be produced when the negative comes to be developed. The preservative liquid that I use is made up by mixing 15 grains of tannin solution with one ounce of rain-water; after filtration, one-third of a drachm of glacial acetic acid is added, for the purpose of preserving the liquid, which may then be employed as frequently as desired, provided it is filtered every time that it is used.

4. *Proper exposure and development conducted according to the nature of the object.* The most important operation in connection with a dry plate process is the development. Under-exposure and over-exposure may be herein counteracted and corrected, provided the error committed is not too grave. Of invaluable assistance is the system of moistening the plate with a mixture of alcohol and water prior to its treatment with the developing solution, as by the omission of this operation most collodion films are apt to become covered with twig-shaped markings. The alcoholic mixture should be allowed to remain upon the surface an appreciable time, for in hot weather the plates sometimes become very dry, and are then exceedingly liable to the defects just

mentioned. For development I use, for an ordinary stereoscopic plate (exposed, say, five minutes before a usual landscape with No. 5 diaphragm), 3 drachms of distilled water to which 7 to 12 drops of concentrated alcoholic pyrogallic acid solution have been added, together with not more than 2 to 4 drops of silver solution* in the first instance, in order that the picture, when first developed, may be thin and full of detail. As soon as the details in the shadows are perceptible, more silver is added to the mixture, and the picture intensified to the requisite degree. When manipulating with reproductions of interiors, requiring an exposure of one or more hours, I add to the 3 drachms of distilled water 30 to 50 drops of the pyrogallic solution, and pour this first upon the moistened plate without any addition of silver whatever. Often a few black outlines of the lights are by this means developed, but very slightly, similar to those seen on negatives treated with an alkaline solution. In this manner the hard appearance sometimes worn by pictures of interiors is easily avoided.

REPRODUCTIONS OF WORKS OF ART OF ALL COUNTRIES.

A CORRESPONDENCE has recently been published between the Prince of Wales, President of Her Majesty's Commissioners for the Paris Exhibition, and the Duke of Marlborough, in which the aim is to popularize art education by promoting art reproduction. The Prince of Wales states that during the Paris Exhibition a Convention was entered into by several princes of the reigning families of Europe, whereby they agreed mutually to assist the museums of Europe in procuring casts and copies of national objects for the promotion of art, and asks the co-operation of the Science and Art Department.

The Duke of Marlborough replies, giving his cordial adhesion to the project. The following are the conditions of the

CONVENTION FOR PROMOTING UNIVERSALLY REPRODUCTIONS OF WORKS OF ART FOR THE BENEFIT OF MUSEUMS OF ALL COUNTRIES.

Throughout the world every country possesses fine historical monuments of art of its own, which can easily be reproduced by casts, electrotypes, photographs, and other processes, without the slightest damage to the originals.

(a.) The knowledge of such monuments is necessary to the progress of art, and the reproductions of them would be of a high value to all museums for public instruction.

(b.) The commencement of a system of reproducing works of art has been made by the South Kensington Museum, and illustrations of it are now exhibited in the British Section of the Paris Exhibition, where may be seen specimens of French, Italian, Spanish, Portuguese, German, Swiss, Russian, Hindoo, Celtic, and English art.

(c.) The following outline of operations is suggested :—

1. Each country to form its own Commission, according to its own views, for obtaining such reproductions as it may desire for its own museums.

2. The Commissions of each country to correspond with one another, and send information of what reproductions each causes to be made, so that every country, if disposed, may take advantage of the labours of other countries at a moderate cost.

3. Each country to arrange for making exchanges of objects which it desires.

4. In order to promote the formation of the proposed Commissions in each country and facilitate the making of the reproductions, the undersigned members of the reigning families throughout Europe, meeting at the Paris Exhibition of 1867, have signified their approval of the plan, and their desire to promote the realization of it.

Princes of the following countries have already signed the Convention :—Great Britain and Ireland, Prussia, Hesse, Saxony, France, Belgium, Russia, Sweden and Norway, Italy, Austria, and Denmark.

* The silver solution here alluded to is the following :—

Nitrate of silver	...	...	...	20 grammes
Citric acid	...	...	...	20 "
Water	...	...	...	1 ounce

* Read before the Vienna Photographic Society.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER XXXV.

As the composition of family or social groups is so difficult, I introduce yet another example, this time with most of the figures standing. It is by Wilkie, and represents "Sir Walter Scott and his Friends," the figures being dressed in rustic costume, and treated in a picturesque manner: a subject on which I shall have something to say in another chapter. The fact of the design being by Wilkie, of whom it may be almost said he never misplaced a line, is sufficient to recommend it to the attention of the student. The chief object in the composition is Sir Walter Scott, and he is placed near the centre; but the artist has avoided the

error of getting the head precisely in the middle, which is the weakest place in any picture. He is also further distinguished from the surrounding figures by being the only one represented seated; this gives the figure a dignity which contrasts well with the others. The pyramid formed by Sir Walter is supported by the flagon and cloth in the foreground. The student will note that these objects—the highest light and the deepest dark in contrast—form the key-note of the group. He will also notice something analogous in every well designed group of figures: "The string shows through all the beads." Many of the pictures selected to illustrate these concluding chapters will be found to have it, although they were not chosen to illustrate this especial point.

It should especially be noticed that every line and form is arranged so that a series of pyramids intersecting each other are created; that the apex of each pyramid is espe-



cially emphasized; see the dark hat of the tall standing figure, which forms the point of one of the principal pyramids, and the milk-pail which caps the other; then notice how the pyramidal groups cross one another, the staff of Sir Walter Scott forming part of the side of the pyramid of which the milk-maid is the principal figure, and whose foot makes one of the base angles of the other group. Another pyramid, which has for its apex the head of the woman in a bonnet, runs into the adjoining similar form; and the black basket on the woman's arm, combined with the dark form of Sir Walter's favourite deer-hound, admirably supports the whole group. Of this dog it may be mentioned by the way, the owner used to say that he always liked to have him with him in his walks, if for nothing else but to

furnish a living object in the foreground of the picture; and he noticed to a companion how much interest was given to the scene by the occasional appearance of the black hound at unexpected points. Sir Walter always talked and wrote of scenery like a painter, yet for pictures as works of art he never pretended to have any regard.

There has been much discussion as to the position of the horizon in a figure photograph, some asserting it may be almost anywhere, even as low as the feet, so that it is conducive to pictorial effect, while others hold that it must be level with the head of the figure, because the horizon is always level with the eye of the observer; but for this to be true the eye of the artist must be on a level with the head of the model, which never need be the case; in fact, a photo-

graph of a standing figure taken with the lens level with the head would, if the lens were not of very long focus, be considerably distorted and out of drawing in the legs and feet; on the other hand, if the lens were very much lowered, as would be the case when the horizon is represented low, the face would be shown at a great disadvantage, presenting the chin and the nostrils as the most prominent objects. A middle course appears to be best, where the lens is stationed opposite the breast, and its focus requires it to be not less than sixteen feet from the model; the horizon would then be a little below the shoulders, and leave the head clear against the sky; in our illustration Wilkie has placed it rather higher, but he has made it so indistinct that it does not interfere in the least degree with the figures.

It may be taken as a rule that, other things being equal, the lower the horizon the larger will the figure appear.

Even in his humblest subjects Wilkie composed gradually. In noticing this fact Burnet observes: "Many who may notice these remarks will perhaps conclude that Wilkie, in familiar subjects, may be compared to Raffaele in the great compositions of historical painting, and that he may be subjected to the same chilling critical expression: that he arrived at excellence, not so much from his power of genius, as his long study and application. But nothing great or lasting can be achieved without minute investigation into the works of nature, and as we perceive the means she takes to produce the endless variety of effects, we are rendered more capable of imitating her." It was not so much the overpowering impulse of genius that made Wilkie a painter, as hard study. Genius is not to be despised, but it is of very little use if it be not supplemented by that success-compeller—work.

OBSERVATIONS ON THE CARBON PROCESS.

BY M. JEANRENAUD.*

THE process which I am about to describe is that made known to us by M. Poitevin, M. l'Abbé Laborde, M. Fargier, and M. Swau. It is based upon the action of light on gelatine impregnated with bichromate and mixed with certain colouring matters, upon the necessity of washing the impression thus obtained from the reverse side, upon its transfer to a support by means of a cementing material insoluble in water, and upon its final re-transfer to a definite basis.

The beautiful examples produced by M. Braun demonstrate the perfection to which this process may be brought, and in order to induce a more general employment of the methods I have deemed it desirable to make an investigation into the subject for the purpose of discovering the most suitable formulæ, and thus aiding the operator in the practical manipulations. At the same time it must be remembered that the process is a patented one, and that all desirous of practising it commercially must first purchase the right so to do.

I have been assisted in my researches by M. Gobert, who had already made a large number of experiments in this direction, and with his help I have sketched out the following mode of operating, which was included in M. Davanne's *Annuaire* for the present year.

Preparation of the gelatine.—The best gelatine for the purpose is that of ordinary quality, which is sold in commerce in thin sheets. The superior colourless qualities are not at all suitable, but that description of material which possesses a yellowish appearance, and costs from three and a half to four francs per pound, has been found to yield the best results. If the finest gelatine only is procurable, then a small quantity of good glue should be added, in the proportion of one part of the latter to three of gelatine; by this means a compound is obtained possessing the requisite degree of solubility. Glue employed alone does not set readily, and, notwithstanding the reaction of the bichromate

of potash and ammonia, remains in too soluble a condition. Take of—

Gelatine	...	...	60 to 70 grammes
Water	...	...	1,000 cub. centimetres
Glycerine	...	...	20 do. do.

If the addition of glue is necessary, substitute a portion of the gelatine (say 20 to 25 grammes) by an equal quantity of glue, which should be allowed to moisten in cold water twenty-four hours beforehand, to facilitate its dissolution. The mixture is placed in a water bath to ensure perfect solution.

Pigments, or colouring-matter.—The colouring-matters used must be insoluble, and ground so fine that when mixed they produce tints of the most perfect regularity, similar to those obtained with sepia or Indian ink; they should likewise be of a light specific gravity, so as to remain in suspension in the gelatinous liquid. If a mixture of various colours is prepared, it is necessary that all of them should be of the same density, otherwise they will become separated, and an inequality will be observable in the tints. The colours can only be properly prepared by an operator skilled in the work; and I take this opportunity of thanking M. Colcomb Poignaut for his assistance in furnishing me with a series of tints specially prepared for my experiments.

The pigment which has furnished me with the best results is lampblack to which was added a small quantity of purple (*purpurine*); this mixture was found to counteract the greenish tint imparted to the gelatine by an insoluble oxide of chromium, which becomes formed in the process.

The colouring-matter is added to the gelatine by degrees in such quantities until a few drops of the mixture placed upon paper appear completely black, although, when viewed by transparent light, they are not opaque; the proportion of colouring-matter to be added is varied according to the general character of the negative. When the pigment has been thoroughly mixed with the gelatine the compound is strained through a sieve of fine silk, which keeps back all coarse particles, the operation being facilitated by means of a camel's hair brush, which may previously have been used in mixing the colours. The mixture, when strained, should be placed in a vessel in the water bath.

Coating the paper with gelatine.—The most suitable method of applying the gelatine is to place a series of glass plates one above the other in a light wooden frame, the first plate being fixed in a perfectly level position, so that the others, when placed above it, are also quite level. A moistened sheet of paper is carefully laid upon the first plate, care being taken to avoid the formation of air-bubbles, and the excess of water removed by the application of a piece of filter paper. The coloured gelatine is placed in a vessel furnished with a spout (an ordinary porcelain teapot will answer the purpose), the orifice of the latter being contracted to a diameter of about 2 millimetres by fitting to the same a piece of narrow tubing; and the liquid is then poured upon the paper in a series of parallel lines which run into one another, and form, while yet warm, a perfectly smooth film of uniform thickness. If the gelatine is too warm when used, inequalities of a circular form will be produced; but at a suitable temperature of about 30° C. the mixture flows like syrup, and gives a very even surface. It is convenient to facilitate the spreading of the gelatine by means of a glass triangle of the same breadth as the sheet of paper.

A second plate of glass is now placed upon the first, and the operation repeated. At an atmospheric temperature of 12° to 15° C. the gelatine sets so rapidly that one is able, after a series of five or six plates, to remove the first sheet from its position, and to hang it up to dry in the open air, so that the operation of coating may continue in a regular manner without cessation. If the temperature is below 12° C. the gelatine sets too rapidly, and if above 20° C. it takes so long to congeal that it is necessary to work with a large number of frames. The sheets require exposure to the air for twelve to twenty-four hours before they are perfectly

* Read before the French Photographic Society.

dry, and they should then be piled upon one another, and stored in a slightly damp locality, in order that they may regain their former evenness of surface.

Sensitizing.—A solution of bichromate is prepared of three per cent. strength for winter use, and two per cent. for summer; and to this is added one or two per cent. of pure glycerine (according to the dryness of the atmosphere), and one cub. centimetre per cent. of pure ammonia. Each gelatinized sheet is immersed in this cold solution, and after remaining therein for the space of three or four minutes, removed and hung up to dry. The operations of sensitizing, drying, &c., must, of course, be performed in a dark work-room illuminated by a small lamp or a window of yellow glass. When dry they are put away in a box, being laid perfectly flat, and placed in a cool place, so that they may become sufficiently pliant and flexible for manipulation in the printing-frame. It would appear preferable to make use of a new bichromate bath for every fresh batch of paper.

Exposure.—The period of exposure varies, of course, with the intensity of the light and the transparency of the negatives, but it may be said to be about a quarter of the time necessary to produce a print with chloride of silver. An over-exposed print becomes sticky, and is difficult of removal, while an under-exposed impression is incomplete when developed; at the same time much may be done in the operation of development by using water in a more or less warm condition.

As I before stated, the fine details and half-tones can only be obtained by washing the print from the back, and it is necessary, therefore, that the gelatine surface which has received the photographic impression should be attached to a sheet of paper by means of a cement insoluble in water: a mixture of india-rubber and resin forms the best cement for the purpose.

Preparation of the paper with India-rubber cement.—The following compound is prepared:—

Rectified sulphuric ether	...	...	200 cub. cents.
Native white rubber, cut into thin strips	...	...	20 grammes.

The latter is allowed to moisten in the ether for twenty-four hours, when is added—

Ordinary benzole	...	200 cub. centimetres
Gum elemi*	...	20 grammes.

The whole is thoroughly mixed by frequent agitation, and the result should be a syrupy liquid of thick consistence, which requires straining first through a piece of coarse muslin, and afterwards through flannel, to remove any precipitate that may have been formed. The solution which I have found to answer best is the soft india-rubber cement of commerce, dissolved in benzole, in the proportion of 100 cub. centimetres of the cement to 500 cub. centimetres of benzole.

This india-rubber solution is poured upon sheets of paper in the same manner as collodion, the corners of the sheets having first been turned up to facilitate the operation; the paper is hung up to dry, and if it does not prove sufficiently adherent a further quantity of the solution should be poured on at right angles to the first application, so as to ensure a coating of uniform thickness. The whole operation of preparing this cemented paper may be performed some time beforehand; but, inasmuch as the prepared sheets stick together if piled one upon the other, it is perhaps better to make it as wanted.

When the sensitized gelatine film has been sufficiently printed, it is taken out of the frame and laid upon a flat surface (upon a marble slab or glass plate); a sheet of paper covered with the india-rubber solution is then placed in contact with it, and both pressed firmly together, first by the hand and afterwards by drawing over them the edge of a plate so as to exclude all air-bubbles; if the two surfaces do not adhere perfectly they may be placed under a press and subjected to a slight, even pressure.

* I have likewise found gum dammar to answer perfectly.

Development.—The image, thus imprisoned between two sheets of paper, is put into cold water to soak, the temperature of the same being gradually raised to 30° or 40° C. The sheets soon separate from one another, the image leaving its original support, and becoming adherent to the film of india-rubber. The print is rocked to and fro in the water, the temperature of which is gradually raised, until all the soluble parts of the gelatine compound have been washed away; care must be taken to prevent the warm water being poured over the print, and, least of all, over the half-tones, which are so delicate that mere contact with water of too high a temperature is sufficient to remove them altogether. If the operation has been successful, an image of great purity is obtained, and this is washed rapidly twice or thrice in cold water, and then placed upon a sheet of filter-paper to dry. At this stage the picture is reversed, and requires to be detached from the film of india-rubber, in order to be viewed in its proper light.

Transposition of the print.—The best way of performing this operation is to prepare a gelatine solution of one per cent. strength, and to immerse therein the finished print, together with a sheet of paper of good quality; then, placing the two together, and taking care that no air-bubbles are formed between, the sheets are slowly drawn over the edge of the bath, and removed from the liquid and hung up to dry. The operation may also be performed by first coating a sheet of paper with a 5 per cent. solution of gelatine, and then manipulating in the same manner as above, but in a bath of cold water. When dry, the india-rubber may be removed by means of a sponge or dabber impregnated with benzole or ether; but a better and more economical mode of proceeding is to roll up the prints and to place them in a glass tube, together with a quantity of ether, and by agitating the same to remove the rubber; the ether may be used again and again until it has quite evaporated. Any particles of india-rubber still remaining on the print are easily dissolved away by immersing the latter in benzole, and afterwards cleaning it with a soft piece of rag.

The finished print is trimmed and mounted on cardboard in the ordinary manner. The most preferable mounting material is a 20 per cent. solution of gum arabic added to an equal quantity of solution of alum.

THE COFFEE PROCESS.

MR. JEX BARDWELL, with whom this process is a favourite, gives the following comprehensive account of his operations in our excellent contemporary the *Philadelphia Photographer*.

No. 1.—Silver Bath.

That which you use in your daily practice, presuming that it gives a clean, clear negative by the wet process.

No. 2.—Collodion.

Any good sample of collodion containing a fair share of bromide.

No. 3.—Developer.

Alcohol	...	...	1 ounce
Pyrogallie acid	...	...	96 grains

No. 4.—Silver Solution for Development.

Water	...	...	1 ounce
Nitrate of silver	...	...	10 grains
Citric acid	...	...	20 "

No. 5.

Water	...	...	1 ounce
Nitrate of silver	...	...	20 grains
Citric acid	...	...	20 "

No. 6.—Substratum.

Water	...	...	5 ounces
Gelatine (Coxe's)	...	...	20 grains
Iodide of cadmium	...	...	2 "
Bromide of cadmium	...	...	2 "
Alcohol	...	...	2 drachms

No. 7.—*Coffee Solution.*

Coffee, roasted and ground	...	2 ounces
White granulated sugar	...	1 ounce
Water	...	20 ounces

In making No. 6 put the gelatine into the water cold, and let stand for a few hours, and then add the iodide and bromide, and apply a gentle heat till dissolved; when cool, add the alcohol, and filter till perfectly bright.

In making No. 7, add the coffee and sugar to the water cold, and raise to a boil; let cool, and filter bright.

Perhaps it would be best that I should give an evening's work, supposing that the operator has no especial room set apart for this kind of work. Should he succeed, and make a business of it, it is well to have a room constructed so that plates could be prepared at any time; but we will take, for instance, the kitchen for the workroom; time, when the women folks have gone to bed, the table being your bench, and the stove convenient to finish drying your plates, the sink or slop-pail to receive the waste water from washing, a tin that will hold about a quart of water, having a spout with a rose attached to it in the same manner as a garden watering-pot; two four-ounce wide-mouthed bottles for the substratum; a small glass funnel, two dishes, such as are used by the women folks, of an oblong form with sloping sides, of such a size that the plate may rest on the sides without touching the bottom, a few tennenny nails, and a cloth to wipe your fingers on, is about all that is necessary.

First take a board about two feet long by one wide, and drive as many pairs of tennenny nails into it as you have plates to prepare, placing the nails about two and a half to three inches apart for the plates to dry on, and set it on the table with the upper end resting against the wall. Presuming the glass to be clean, you coat the plate with substratum in the same manner as you would flow the collodion, it will flow just as readily. Return the excess into the funnel standing in one of the wide-mouth bottles, and into which is placed a small piece of sponge through which the collodion is filtered, when it will be in a fit condition to use again; then set the plate on the nails, with the lower corner resting on the board, when it will drain and dry quite quickly without fear of a back flow. After having coated as many plates as you wish, take the first one and dry completely by the stove, for should it retain any moisture, it might cause the collodion to slip, either in the bath or the washings; you then coat a plate with collodion which we will call No. 1, and place it in the silver bath for about three minutes, when, on taking it out, you will place it face down in one of the oblong dishes, which should be filled with water; then coat plate No. 2, and put into the bath, fill the tin can with a quart of water, and take plate No. 1 out of the dish (it should be moved in the water of the dish until the greasy lines have disappeared), and gently wash with the quart of water, which runs through the rose, then put it into the other dish, which should contain the coffee solution, coated side down. Now take out plate No. 2 from the bath, and put it into the dish of water. Coat with collodion, plate No. 3, and put it into the bath; then take plate No. 1 out of the coffee, and set it up to drain in the same manner as before described; then take plate No. 2 out of the water, and wash as before, and put into the coffee; take out No. 3 and put it into the dish of water, and so continue till you have all the plates done. As soon as they get surface-dried take plate No. 1 and hold it either before the stove or in the oven till perfectly dry—you might almost say baked. In making tannin plates this would cause a quantity of fine circular lines across the plate, but, in this process, I never have had great difficulty; on the contrary have found great advantage in thus baking. The plates are now finished; put them away in your changing-box.

There is, certainly, no difficulty in thus preparing them; it is easy and sure. So far everything is well. I would recommend that the corners of the glass be well rounded and

the edges ground, as they change in the box with so much greater ease, and I find the sharp corners and edges of the plate are apt to fray the wood-work of the box, thereby causing, in time, a sparkle of dust. Should it be deemed best not to use a substratum, which, in fact, I do not recommend if the intention is to work for quick exposures, and with the alkaline development, in such case you should, just before commencing to develop, run around the edges of the plate a camel's-hair pencil charged with Anthony's diamond varnish, which will effectually prevent the film from slipping; the varnish dries quickly, and is the best thing I know of for that purpose. It may be thought, that in consequence of the coffee containing sugar, that it would cause the plates to be sticky; but such is not the fact, they are remarkably hard. It is of the utmost importance that you keep your fingers clean, and, in order to do so, wipe them after each operation, on the damp cloth kept for that purpose, and try to treat each plate just alike; for instance, should you wash one plate more than another, it may cause a difference in the sensitiveness. After some practice, you get to know just the time to give the plate an exposure, with as much certainty as if in your room.

Now comes the tug of war—the development; it is where so many fail. It requires all your care, patience, and good judgment. By the proper exercise of your judgment, in the proportions of the pyrogallie acid and silver, it is in your power to completely control the development, and make a good negative out of what, under ordinary circumstances, would be a complete failure. It is this power that makes pyrogallie acid so valuable as a dry-plate developer. On taking the plate from the changing-box, you first run the varnish around its edges; this, however, is not needed if the substratum has been used; then flow the plate with water, so has to completely moisten the film; then, into an ounce of water, drop five to ten drops of No. 3, and flow the plate with it, and if the picture begins at once to make its appearance, return it to the glass and add a drop of No. 5, but, if slow, a drop of No. 4; then, if the time of exposure was about right, the picture will come up all right; but if the detail are at all backward in making their appearance, add a little more of No. 3. When the details are all out, wash this plate, and you will have a negative perfect in detail, but lacking intensity; but this latter may be obtained by washing the plate, and mixing in another clean glass half an ounce of water, ten to fifteen drops of No. 3, and about ten drops of No. 5; and, on flowing the plate, it will at once acquire intensity. Care should be taken not to carry this too far, as the color of the plate is very non-actinic, and you may produce a negative so intense as to be useless. Then, after well wash and stand up to dry. Do not varnish till perfectly dry, nor attempt to print till the varnish is hard.

I think there is no person who has had any practice with dry plates, but will be pleased with the ease, certainty, and simplicity of this process; but, to those who are making their first attempts, I would present to them a key to success, which is patience, for, without that, no man may expect to be an expert in the practice of dry-plate photography. It is well to remember that pyrogallie acid fetches up the picture and details, and silver produces intensity and hardness; but upon the proper addition of each (which addition must be ascertained as the picture makes its appearance) will depend the value of your negative.

The water used in making solutions and in washing, is such as is supplied to the city by the water-works. I have never observed any trouble that I could trace to its use; therefore, find no necessity to recommend the use of distilled water.

Proceedings of Societies.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held on the 7th ult., M. DAVANNE, Vice-President, in the chair.

M. PLACET addressed to the President of the Society the following letter, relative to the photo-engraving process recently patented by M. le Colonel Avet:—

"I find in the last number of the *Bulletin* an extract of a patent for photo-engraving secured by M. le Colonel Avet. The process detailed is no other than my own, patented in 1861 and 1863, and published in the *Bulletin* of the 4th December, 1863. It is to be regretted, therefore, that the researches of M. Avet, seconded by those of his adjutant, M. François Drivet, have merely resulted in the discovery of a process which has been known and applied for some considerable time.

"M. Avet is evidently but ill-informed of previous experiments and discoveries, for the artificial grain which he has likewise just invented is, in my opinion, a very old affair. This grain, produced by means of network, has been experimented with times without number, and has always been rejected on account of its monotonous uniformity. M. Avet's grain, however, be it understood, does not in any way resemble mine, and in this respect I do not wish to assert any claim whatever, for in my process the grain is produced of itself, varying in size on every picture, from the intense blacks to the fine details, where it first becomes perceptible."

M. DAVANNE remarked that in reading the accounts of the two processes as they appear in the *Bulletin*, there was certainly a very great analogy between them.

M. LE COMTE NOSTITZ presented to the Society a specimen picture, showing the result of using an iron developer with dry plates prepared by M. Manners Gordon's gum process; the specimen was a portrait obtained with a very rapid exposure on a dry plate.

M. JULES GIRAUD exhibited a collection of micro-photographs, and read a communication detailing the manner in which they were produced.

M. GRUBB, of Dublin, presented the Society with a series of photographs of the moon, taken by means of a telescope constructed for the Government of Melbourne; the pictures were taken on the 1st February last, with an exposure of half a second to two seconds, bromo-iodized collodion being used for the purpose, with iron and pyrogallie acid development.

M. DECAIGNY exhibited a large number of prints taken by the Taupenot process, and read the following communication in regard to them:—"The pictures here produced may be divided into several classes, representing nearly all the difficulties against which the photographer has to contend; they include the following reproductions:—

- "1. White marble statues taken in and out of doors.
- "2. Interiors with strong contrasts.
- "3. Monuments with sky and water.
- "4. Landscapes with strong contrasts.

"An inspection of these pictures will suffice to show that, however strong the contrasts may have been in the original, a satisfactory reproduction has generally been obtained, and with the permission of the Society I will expound my theory of the Taupenot process, a theory which I believe holds good in all dry-plate processes.

"The Taupenot process can never be successful without, as in the wet process, the whole picture is at once developed in one operation, recourse being had afterwards to the intensifier; this may be proved in the following manner:—Let us suppose that we have to secure a picture, at any moment, of a landscape with sky and water, together with an old monument or mossy ruin in the foreground; to effect this, either of two ways is generally employed, the first being to give a good exposure and to employ a slow and mild development. What is the result? If a long exposure is given, the high lights of the picture are very quickly developed, and the operator finds himself with a choice of two evils; he may either finish at once, or he may proceed with a slow development. If he takes the former course, the sky and water become impermeable; if the latter, the image becomes flat, the different planes run one into the other, and distance is lost in the sky, while the latter, together with the water becomes dull, the silver refusing to precipitate itself upon those portions of the negative. When even the details in the shadows are brought out, the effect is not more satisfactory. The second way of operating is to time the exposure for the high lights only, and then, if the negative is treated in such a way as to give details in the shadows, the sky and water become covered with a deposit of silver, which is with difficulty penetrable by light.

If, however, as in the first way, a good exposure is given, and the picture developed in such a manner that the whole of the

details are brought out at once, the silver will be found, when the plate is afterwards intensified, to deposit itself equally over the whole surface, securing a result both soft and harmonious.

M. BRIOIS exhibited to the Society some sheets of collodion tinted at the borders, and uncoloured in the centre, suitable to act as screens for obtaining portraits of graduated tint, and likewise other films of collodion, both coloured and uncoloured, for serving as transports for positives.

The proceedings then terminated.

Correspondence.

"LUX GRAPHICUS" ON THE WING.

THE HARVEST IS OVER, THE GRANARIES ARE FULL, YET FAMINE IS IN OUR MIDST—PHOTOGRAPHERS' BENEVOLENT AND PROVIDENT SOCIETIES—PHOTOGRAPHY ENNOBLED—REVIVAL OF THE EBURNÉUM PROCESS—THE SOCIETIES AND THE COMING SESSION—PHOTOGRAPHIC APPARATUS V. PERSONAL LUGGAGE.

DEAR MR. EDITOR.—My quill is as restless as my wing, and as I skim about like the swallows, many things fall under my observation that would otherwise not do so, some of which are noteworthy and of interest to the photographic profession, many are not; but harvest time is interesting to every one, and it is of this I am going to make a few remarks. It is always a subject of grave importance and anxiety to a nation like ours, with a very limited area of cereal land, until it is known whether the harvest has been abundant or otherwise. It is also equally important that the harvest, however plentiful, should be carefully reaped and garnered, so that famine may not fall upon the people before another season of plenty shall come in its course. The cereal harvest is over, and has been wonderfully abundant, in spite of the unusually long, dry, and hot summer. The stack-yards are full, and the granaries are teeming with plenty, and there is bread enough for all that can afford to buy. There, that is the qualification that brings to my mind the most serious part of this subject. Although the season has been wonderfully fine and favourable for a rich harvest of all things, "famine is in our midst." A cry of woe is mingled with our mirth. A glorious summer and autumn have, on the whole, yielded a rich reward to the labourers in the pleasant and profitable fields of photography; yet there is want among some of the workers. In the columns of your contemporary I observe a letter "begging alms" on behalf of a poor widow and her little orphans. It is a case of pure charity, and far be it from me to say to any one, "Do not help her;" "They have no claim on the sympathies of the photographic public;" "Neither she nor her late husband did anything to forward the progress of the art nor advance the interests of photographers in general." I grant the latter hypothesis, and say, "He that giveth to the poor lendeth to the Lord." Nevertheless, I cannot refrain from expressing my opinion that such painful appeals should not be allowed to appear in the columns of the photographic journals; all such private cases could and should be provided for by any of the provident organisations so common to other trades. The subject has been frequently mooted in your own columns, but no action has been taken. Very recently a lady correspondent called attention to the subject again, and now, in the pages of your contemporary, I notice an elaborate plan is laid down as the ground-work of a Photographer's Provident and Benevolent Society. That plan is open to some objections, but it is certainly desirable that such a society should be formed. It is rather late in the season for photographers to make any provision for cases 1 and 2 as the correspondent in your contemporary suggests—this year, at least—but I think his other plan of making a provision, however small, for widows and orphans, is highly to be commended, and if only carried into effect would undoubtedly mitigate the anguish and lessen the fear of want in the minds of many deserving women, and might prevent the recurrence of those painful appeals to which I have just alluded. It is just as important and imperative a duty for every man to make some sort of provision for those dependent upon him, as it is for the husbandman to reap and carefully house his harvest. Knowing the interest which you, Mr. Editor, personally take in this subject, I trust that you will exert your influence, and see if it be possible to found a society *at once* that will grow in after years to

be a monument to photography and to the goodness and forethought of the photographers of the present generation.

Photography, like the fine arts, is honoured with a title of nobility. A baronetcy has recently fallen to the lot of one who for years has followed photography as a profession, taking cartes-de-visite and other photographs in the usual business-like manner. Of all the styles of distinction that are conferred upon men, I think baronetcies have been subject to the greatest number of vicissitudes, and spiced with the greatest amount of romance, from the romantic succession of Sir Robert Innes to Sir William Don, "a poor player;" and now the photographic profession includes among its members one of the baronets of England.

Your description of the Eburneum process, given recently in your "Visits to Noteworthy Studios," has awakened quite a new interest in that beautiful form of photograph, introduced a few years ago by Mr. Burgess. Several photographers whom I know have set about producing them. The specimens which I have seen are very beautiful as cards, but they are particularly suitable for lockets, brooches, studs, pins, rings, &c., being sharp, clear, and delicate, and easily cut to fit any size or shape.

Next month some of the London photographic societies will commence the session of 1868-9, and it might be asked, What are their prospects? It is to be hoped that the North London will do better than it did last session. There was more than one *nil* meeting. The South London will doubtless keep up its character, and exhibit its usual vitality. The personal interest taken in the meetings by their kind, genial, and courteous President is almost sure to develop all the latent force of the members. It is also to be hoped that the Society will make as brilliant a start as it did at the commencement of the session last November. Such an exhibition as that in Conduit Street may easily be repeated, though it may not be such a startling one.

The question raised, whether photographic apparatus be or be not considered "personal luggage" by the railway companies, is one of very great importance to photographers, but particularly to amateurs, for if decided against them it will cause no end of inconvenience, vexation, and expense by delays and extra charges. On the other hand, it must be admitted that the view taken by the railway authorities is technically correct. The very word "personal" shows that they mean such articles as are really and absolutely necessary for the personal comfort and convenience of travellers, which can only rightly include wearing apparel, changes of linen, dressing-cases, ladies' work boxes, and writing-desks. These are absolutely indispensable for the comfort and convenience of travellers. Photographic apparatus, and particularly chemicals, do not come under that classification, and I think it is of great consequence to the railway companies and their passengers to know what should, or should not, be put into the "luggage van." I know a case where an amateur photographer was travelling by rail with a 12 by 10 bath full of nitrate of silver solution packed among his clothes in a box in the luggage van. The bath leaked, the solution spoiled all his shirts, and he was driven to the shift of papering his fronts. Now, supposing the box containing the leaky bath had stood upon some one else's box—say a lady's—it might have run through and spoiled some valuable dresses; at the least, it would have spoiled the appearance of the box, to the great annoyance of the lady passenger, and the probable claim on the company for compensation. There are always two sides to a question, and though few men have travelled more with photographic apparatus in the luggage van than myself, I think, in this case, the best of the argument may be fairly ceded to the railway companies.—Yours very truly,

September 18th, 1868.

LUX GRAPHICUS.

CARBOLIC ACID.

SIR,—Carbolic acid is derived from tar. Tar is derived from coal. Coal is wood compressed by the agency of masses of matter, and thereby charred or converted into carbon. Coal was made in many instances thousands of years before the light of the sun dawned upon this earth. The wood of which it is composed flourished and grew under an atmosphere and temperature much hotter than our own. The plants and trees that compose coal grew in an age when carbonic acid gas was in excess. The only light that dawned upon those trees was that of what we call electricity. From tar is derived aniline, and many beautiful colours now used in arts and manufactures.

Query—Whether the latent electricity, as contained in coal,

from whence proceeds and is produced carbolic acid, is conducive and beneficial to our silver baths? Mr. Warner, in a contemporary journal, would lead one to consider that it was. Has this ever struck any of your readers?

Electricity, a wood force, plays a much more important part with our productions than we have any idea of. Let your readers look into these facts.—Yours, H. O.

WHAT IS PASSENGER'S LUGGAGE?

DEAR SIR,—The question arises, What is passenger's luggage, photographically?—About seven weeks since I started on a photographic trip, taking a third-class ticket. My luggage being in excess of my allowance, they charged me 5s. 8d. overweight. Upon my reaching my destination and looking after my luggage, I found my dark box streaming out a liquid in such a manner convinced me something was smashed. It was but the work of a few seconds before the straps were undone, and, to my annoyance, I found my glass bath was smashed, and contents gone, thus losing the whole of my bath. I made my claims to the S. E. R. Company, and I enclose you their letter (which please return) for the benefit of travelling photographers. I remained five days doing no work, during most beautiful weather. For the future my bath don't leave my sight. It has travelled hundreds of miles. Its bottom dropped out several times by the rotting of the brass screws, but never such a smash. It was nearly a quarter of an inch thick, and now all in atoms.—Yours truly,—G. B. SHEPHERD.

3, High Street, Tunbridge Wells, Sept. 22nd, 1868.

[Annexed is the letter received from the secretary of the railway company in answer to an application for compensation.]

"Mr. G. B. Shepherd, 3, High Street, Tunbridge Wells.

"SIR,—Referring to your communication of the 1st inst. on the subject, I beg leave to acquaint you I have caused enquiry to be made, from which it appears that on the 28th ult., whilst in course of conveyance for you to Shorncliffe as passenger's luggage, a package containing a photographic bath and chemicals sustained damage in some way.

"In a case of this kind, however much the Company regret the loss to the owner, they cannot, as a principle, admit liability upon themselves in any way in the matter, such things not really being passenger's luggage within the meaning of the act.—I am, sir, your obedient servant,

"C. W. EBORALL, General Manager."

Talk in the Studio.

PIRATING MR. WOODBURY'S PROCESS.—M. Levitzky, writing from St. Petersburg to Mr. Woodbury, says that a person styling himself Adolphe Angerer, and announcing himself as brother to the celebrated photographer of Vienna, is offering to sell Mr. Woodbury's process to photographers in Russia, and alleging that he has worked with Mr. Woodbury and acquired the process. His pretensions are altogether without foundation. Mr. Woodbury knows nothing of him, and Herr Angerer, of Vienna, states that he has no relative of that name.

PRESERVING PROTOSULPHATE OF IRON.—M. Wellborn states, in the *Journal de Chimie*, that a small piece of camphor placed in a bottle of protosulphate of iron will preserve it perfectly free from oxidation.

THE COFFEE PROCESS.—Mr. W. F. Morgan, of Bristol, well-known as a skilful dry-plate man, says, in a recent letter: "As a dry-plate amateur—chiefly, until lately, with tannin—I must bear testimony to the superiority and simplicity of the coffee process. It appears to me all that its most sanguine admirers claim for it. The film has a tendency to leave the glass, but an edging of varnish secures it."

FLUORESCENCE.—The *Norfolk News*, speaking of Professor Stokes, the President-elect of the *British Association*, gives some account of his experiments in examining the chemical rays of the spectrum by other than photographic means. It says:—"There are certain substances which, when placed in these feebly-luminous rays, become apparently self-luminous, and shine out in the partial darkness of the room with strange brilliancy and beauty. When most of the luminous rays of

white light are cut off by sheets of manganese glass, by cobalt glass, or by a trough filled with ammonia-sulphate of copper, rays scarcely visible to the eye may be made to pass through the room. Then, when slabs of uranium glass, or screens painted over with a solution of rescoline, are placed in the path of these rays, they appear to be self-luminous, and glow with unearthly beauty. We have tried many of these experiments, and find that when uranium glass is the recipient of the rays, it glows with a yellow colour like the moon, when illuminated with the blue rays of the spectrum; but the nearer the colour of the incident light approaches to violet, the greener and the more ethereal is the glow of the uranium glass. Hence it will be seen that if the new President chooses to break through what we are told is an established custom, and next year gives an experimental, instead of a simply oratorical, opening address, the audience will see something worth observing, and yawns and gapes will not greet his gaze."

To Correspondents.

H. O.—The formula of Mr. Bovey's printing bath, in which sugar is used, stands as follows: nitrate of silver, 6 ounces; pure nitrate of soda, 3 ounces; leaf sugar, 2 drachms; water, 80 ounces. Full particulars in regard to the mode of using appear in our last YEAR-BOOK; but the above formula may probably be sufficient for your purpose. The formula for the toning bath appears in our issue for June 26th last. Full instructions cannot be given very briefly; but the formula may be shortly stated thus: to 12 grains of double chloride of gold and sodium add 1 grain of common salt, and pour into this 1½ pint of boiling water; when nearly cool, add 2 gallons of rain or river water, or well water which has been boiled. The bath is then ready for use, and improves with age. For mode of replenishing, &c., see Mr. Bovey's article.

W. F. MORGAN.—Permanganate of potash may undoubtedly be used for decolorizing the printing bath, without any fear of injurious results. We are glad that you find the coffee process so satisfactory.

H. H. CUNNINGHAM.—At one time it was the custom of the Photographic Society of London to hold photographic exhibitions annually; but for various reasons this has not been done of late years. It is intended to open the next session of the Society in November with an exhibition, which will probably be kept open for a few days. The Royal Cornwall Polytechnic Society also devotes a portion of its annual exhibition to photographs. It is held at Falmouth, opening on the 29th of the present month. The exhibitions are generally open to the contributions of all photographers. 2. Chloride of platinum may be used in toning in the same way as chloride of gold; some photographers have recorded that a mixture of chloride of gold and chloride of platinum give better tones than gold alone. We have seen many examples of the results; but, on the whole, prefer gold alone. The presence of platinum tends to a blacker tone, which we do not generally consider an improvement. 3. Heat will of course reduce any salt of silver to a metallic state; but it is not customary for this result to be brought about in fusing nitrate of silver, unless the temperature were unduly raised, or the heat unnecessarily prolonged. It is not an uncommon thing to find that in an aqueous neutral solution of chloride of gold, the salt is occasionally reduced, and metallic gold precipitated. We generally keep chloride of gold in a concentrated alcoholic solution.

L.—The object of using dilute albumen instead of pure white of egg is to avoid an unnecessary thickness of varnish over the transparency; and a very small portion of albumen is generally sufficient to make the aniline colours "take" freely to the picture. The albumen should certainly not be coagulated with a salt silver, as a sensitive compound is at once formed. There are various means of coagulating albumen, such as nitric acid, bichloride of mercury, sulphate of iron, &c. Which of these would answer best we cannot say; but we do not think them necessary, as the aniline colours generally work perfectly on the albumen in its natural state. Of course, a little practice in such colouring is necessary, in order to succeed. We regret our inability to answer such questions privately, but a very large portion of our time would be absorbed if we wrote private answers in even the exceptional cases which occur.

W. J. A. G.—The quality of the collodion may possibly be a cause of the tendency in England's plates to split in drying, but we are not familiar with the fault. The use of a preliminary coating on this plate might prevent it. The application of a dilute solution of gum or of albumen to the finished negative before drying would be a tolerably certain preventive.

A. J.—Bromide of cadmium is tolerably soluble in alcohol and ether, and should generally, with a little agitation, dissolve in collodion. Sometimes a little mechanical aid is necessary. Use a glass rod with rounded end to crush the salt, and mix it with the collodion; or mix the salt into a paste with about half a drachm of alcohol, and then add to the collodion. You will find no difficulty if you aid the solution in this manner.

JOHN BEATTIE.—The unfinished and unsigned letter was doubtless yours, as we supposed, but were not quite certain. We will write to you in a few days.

G. B. S.—All the experience which has reached us tends to prove that blue glass in a studio has no advantage whatever, but some disadvantages.

SYBIL.—Your lines shall have our careful consideration.

VENATOR.—Varnish made according to the formula in question would be of a dark colour; but this, we believe, will scarcely be appreciable on the negative. The object of adding essential oil is to aid in dissolving the gum. Such oils have no other special value. We have often considered the suggestion you make. There are reasons for and against, and hitherto the latter have prevailed. The lighting and general qualities of your prints are good.

H. C. L.—The markings of which you send us an example are known generally as matt silver stains. The causes and remedies are various, and have been extensively discussed in our last two or three volumes. For full consideration of all the causes and remedies we must refer you to the articles which have appeared in our pages under the heading in question. A general remedy consists in extreme cleanliness, keeping the inner frames of your dark slides constantly washed, allowing the plate to rest on clean blotting-paper, avoiding delay between exciting and developing the plate, and avoiding the use of a very strong bath, or a very old one. 2. Cockling is always due to unequal expansion and contraction of the print and mounting-board. One remedy is the use of strong mounts; another, sponging the card, so that it may become as damp as the print before placing the two in contact; another, the use of an adhesive material with very little moisture, such as glue. When paste and similar materials are used, the water penetrates the print and makes it expand. If it be placed on the dry board in this expanded state, it will necessarily contract in drying, and this necessarily drags the board and makes it cockle. 3. The simplest method of ascertaining the precise specific gravity of alcohol of which you know the number of degrees over-proof, is to consult a table of the relations between the two. The term "proof spirit," and the mode of determining strength by degrees over-proof, are both clumsy. As a general indication of their relation, we may mention that proof spirit has a sp. gr. of .9200 at 60° Fah. Absolute alcohol, which has a sp. gr. of .8005, is 70 over proof. Spirit 60 over proof has a sp. gr. of .8298. 4. The offensive smell of some albuminized paper is due to the use of decomposed albumen in its preparation, or to keeping the paper in a damp place, causing decomposition.

W. L. S.—There is no especial advantage in exciting your paper in whole sheets, beyond the saving of time. Where a large amount of printing is done it is a good practice, as it saves time and permits the sheet to be cut up as economically as possible, which dividing the sheet into halves or quarters for the purpose of sensitizing does not always permit.

F. F.—Where all the washing waters, hypo, developing solutions, &c., are mixed together, liver of sulphur (polysulphide of potassium) is the proper material for precipitating the silver. The silver will be thrown down, of course, as sulphide of silver, and can then be reduced in the usual way.

VERY OLD SUBSCRIBER.—Your general design is good. We should prefer facility for extending the light a little laterally; 6 feet 6 inches in front of background, in some cases, will be found too much without light. Better have the whole of the 10 feet in the roof of glass. Use ordinary crown or sheet glass. The ribbed glass will obstruct a good deal of light, and should not be used, except where necessary to exclude direct sunlight, or prevent the interior of the studio being overlooked. As a rule, have all your glass continuous, so as to form one extended light, not a series of small ones. If possible, therefore, bring your side-light a little nearer the background instead of introducing small windows.

HON. J. W. STRUTT.—Received. Thanks.

ERRATA.—In the description of M. Reutlinger's studio, the sitting is described, by a clerical error, as thirty-five minutes; it is obvious that it should have been thirty-five seconds. In the article on India-rubber as a Protection for Negatives, the words "pliable resin" are found in the last line but one of the first paragraph; they should have been "friable resin."

Several Correspondents in our next.

All Communications for the Editor to be addressed to 15, Gough Square, Fleet Street, London, E.C.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Yellow Spots on Prints: Imperfect Fixation	469
Wet Collodion without Water.....	470
Negatives Transferred to Leather Collodion	470
Varnishes for Negatives	471
Echoes of the Mouth, By an Old Photographer.....	471
Foreign Miscellanea	472
Short Essays on Photography and Art. By Nelson K. Cherrill	473
On Gilding Glass.....	474

	PAGE
Pictorial Effect in Photography. By H. P. Robinson.....	475
On the Employment of Collodionized Paper. By Ludwig Schrank.....	476
Correspondence—India-Rubber, Encaustic Paste, &c. — Wet Collodion without Water—Carbolic Acid	478
Talk in the Studio.....	479
To Correspondents	479
Photographs Registered	480

YELLOW SPOTS ON PRINTS.—IMPERFECT FIXATION.

NOTWITHSTANDING all that has been written on the subject of fixing prints, amongst the defects brought under our attention from time to time by troubled correspondents, there is none of such frequent and regular occurrence as the results of imperfect fixation, manifested either by mottled stains of a yellowish green or yellowish brown throughout the print, or by patches or spots of the same colour scattered more or less plentifully over the picture.

The cases of examples of imperfect fixation throughout the whole print are not, happily, of very frequent occurrence. The importance of the plentiful use of fresh strong hyposulphite solution has been so constantly urged of late years, that few photographers are likely to err so far in this matter as to produce the mottled, greasy-looking prints which indicate imperfect fixation in its worst phases; yet several examples of this kind have come under our attention during the last few days, with queries as to the cause of the mottled yellow stains which pervaded the whole texture of the paper. The commoner form of the defect, however, consists in the existence of spots of yellow or yellowish green, or yellowish brown, not seen generally until the prints have left the washing water and are spread out to dry, and sometimes not seen until the prints are mounted. The fact that the print appeared pure and spotless in the various stages of its production, and is only seen a few hours, or sometimes a few days, after a very careful washing, which seems generally the puzzling part of the matter, affords really the certain indication of the cause of the defect.

To make the matter clear to those of our readers who are not familiar with the processes involved in the operation of fixing a silver print by hyposulphite of soda, we may briefly and simply restate the nature of the reactions:—On the first contact of the chloride of silver in the prints with hyposulphite of soda a double decomposition takes place, producing hyposulphite of silver and chloride of sodium. Hyposulphite of silver combines with an excess of hyposulphite of soda, and forms a double salt freely soluble in water. It is on the presence of this double salt that perfect fixation depends, because there is a second form of hyposulphite of silver which is produced when there is not an excess of hyposulphite of soda, and which is comparatively insoluble in water, but soluble in a strong fresh solution of hyposulphite of soda. This sparingly soluble hyposulphite of silver is formed when the fixing solution is nearly exhausted, or when the solution from any cause is prevented from acting freely on the print; and it is to the presence of this salt, and its subsequent decomposition, that the yellow stains of imperfect fixation, either as small spots or universal mottling, are due.

When the process of fixing is going on perfectly, there is

no appearance in the print which presents any peculiarity to the eye; but as soon as the fixing power of the solution begins to be exhausted, or the print from other causes is being imperfectly fixed, on being held up to the light it presents a number of opaque spots of a yellowish tint. If the formation of these spots be discovered at once, they may be at once dissolved, and the print properly fixed by fresh strong hyposulphite solution; but the defect is rarely seen until the decomposition of the hyposulphite of silver issues in yellow stains of greater or less extent.

The single hyposulphite of silver is very prone to spontaneous decomposition, the final products of which are sulphide of silver and sulphur. Its decomposition is still more readily effected by the action of light. Being a colourless salt, it is not, as we have said, observed until it is decomposed; and as the prints are often washed in the dark room during the night, this decomposition rarely takes place until the prints are spread out in the light to dry, and, under some circumstances, at a later period. Sometimes, but rarely, these stains of sulphide of silver will become black; they generally retain the yellow tint of sulphide of silver in combination with a decomposed organic salt of silver. The decomposed salt forming these stains will generally be found in the body of the paper, or between the paper and the albumen, forming opaque patches, as may easily be seen on examining the prints by transmitted light.

The occurrence of imperfect fixation throughout a print is always traceable to the use of weak, exhausted, or acid hyposulphite solution; but the causes of spots or patches of imperfect fixation are often more puzzling to the inexperienced printer. Such spots are, however, generally traceable to one of three causes: 1, the prints sticking together whilst in the fixing bath; 2, the formation of air-bubbles on the prints on immersion in the fixing bath; 3, or the contact of the print with hyposulphite before immersion in the fixing bath.

1. If the prints are immersed in the fixing bath in batches, and are not kept moving, each print receiving separate attention, they are apt to stick together, and some portions of the prints are imperfectly acted upon by the fixing solution. Such prints are liable to irregular yellow patches of imperfect fixation.

2. When a print is first immersed in the hyposulphite solution, air-bubbles are very apt to form on its surface, and adhere with great tenacity, thick horny papers being more liable to this tendency than thin soft papers. If the bubbles are large they are easily seen and removed, and the mere act of turning over the prints will generally break such bubbles; but in many cases minute bubbles are not easily seen, and not easily removed in the ordinary course of moving the prints in the solution. Such bubbles effectually protect the surface they cover from the perfect action

of the fixing solution, and are perhaps the most fertile of all causes of the small yellow spots with which many photographers are only too familiar. The remedy is simple: it is necessary carefully to examine each print as it is turned over in the fixing bath, and remove with a brush or sponge the bubbles as they are formed.

3. The last mentioned cause is not, we hope, very common, but it has come sufficiently frequently under our attention to render a caution to the inexperienced not unnecessary. Young printers who are conducting the whole of the operations themselves are apt to be forgetful of the importance of carefully cleansing the fingers every time they come into any kind of contact with hyposulphite of soda, and a slight taint of this substance on the fingers coming into contact with excited paper will certainly issue in a stain, which will generally become visible before the picture is finished.

Other occasional causes will conduce to imperfect fixation. Occasionally it will result from defects in the paper; and occasionally from the long keeping of excited paper in hot weather, a compound being formed between the silver and the size in the paper not readily soluble in the fixing solution, and eventually issuing in decomposition and discolouration. But our aim has been here to call attention, for the benefit of the less experienced of our readers, to some of the most common and most easily remedied sources of defects which we have reason to believe are only too common.

In answer to the oft-repeated question as to the proportion of hyposulphite of soda necessary to fix a given number of prints, we can only repeat what we have often before stated, namely, that the number which may be safely fixed in a definite quantity of hypo solution cannot be absolutely stated. Much discussion has arisen on the subject, but no absolute certainty obtained. Many circumstances will affect the question, such as the thickness of the paper, the proportion of chloride of silver present, the extent to which it is reduced, &c. Theoretically, about three parts of hyposulphite of soda will be required to dissolve one of chloride of silver. One whole sheet of sensitive paper has been calculated to contain about from 25 to 30 grains of chloride silver. On this theory about half a dozen sheets of paper might be fixed by one ounce of hyposulphite of soda. In practice, however, so many other circumstances interfere, that perhaps not more than one-fourth or less of that number ought to be fixed in the quantity. The rule of keeping the solution alkaline cannot be too strictly enforced, and the use of carbonate of ammonia, as recommended by Mr. Spiller, will certainly conduce to safety. If any trace of acidity exist in the toning bath the prints should be very carefully washed before immersion in the fixing bath.

Observation and experience are, of course, necessary, and form the best guides for the practical printer; and until that experience is gained, the operator should take care never to tread on the heels of danger. As to the time of immersion, the temperature and the quality of the paper will somewhat influence the decision. Thin Saxe paper will generally be fixed in new solution of hypo, or 6 ounces in 4, in about ten minutes; thick Saxe will require fifteen minutes; thin Rive paper about fifteen minutes, and thick Rive about twenty minutes. A slightly albuminized paper will be fixed more rapidly than a highly albuminized sample; the principle being, that the more horny and repellent the surface, the longer the time of immersion.

WET COLLODION WITHOUT WATER.

EVERY photographer knows how much of comfort, and even of success, depends on the observation of apparently minor points in manipulating. We have had many scores of letters thanking us for the publication, a few years ago, of a communication by Mr. Russell Manners Gordon, in which he incidentally pointed out the importance of adding the same proportion of alcohol to the developing and intensify-

ing solutions, and to the silver solution to be used therewith, in the process of intensifying. Attention to this permitted the free mixture of one solution with another, or of one after another, without risk of greasy lines, and consequent stains, and at once promoted ease in working and success in result. We have ever since regarded this as a settled canon of manipulation, to be observed in all circumstances in which it can be brought into operation.

In our recent remarks on Wet Collodion without Water it did not occur to us to repeat the injunction in reference to the preparation of the golden syrup solution. To secure an even flow, and obtain entire immunity from risk of stains, it is necessary to add alcohol to the syrup solution; otherwise, on its first contact with the developer containing alcohol, the well-known repulsion of the particles of the two solutions will take place, causing streaks and stains. Mr. Robinson calls our attention to the importance of mentioning this, in order to save a few disappointments to those who may try the process without at first thinking of this point. He says:—

"In your article on this subject last week you have omitted to state that some alcohol should be added to the preservative solution. Without this addition the golden syrup and water presents a very oily appearance when poured on the developed plate, and stains are inevitable. Of course this does not occur to any great extent when no alcohol has been used in the developer, which is seldom the case, except for very small plates, and few photographers now care to use a developer that will not take kindly to the plate. The best proportions are,—

Golden syrup ...	...	...	10 ounces
Water ...	...	...	10 "
Alcohol...	...	...	6 drachms.

Although the negative may be intensified at home, in practice I always perform that operation in the field, by adding a few drops of silver solution to the iron developer, and using it again. The muddiness formed may be disregarded.—H. P. ROBINSON."

NEGATIVES TRANSFERRED TO LEATHER COLLODION.

MR. WOODBURY has recently brought under our attention some examples of the transferred negatives treated in the mode which he has recently described in our pages. Considering the simplicity of the means and the excellence of the result, it is a little surprising that the system has not been much more commonly adopted than it is at present. Those we have examined are sufficiently thick and firm to be handled with perfect convenience; and, except by wilful injury, it seems impossible that they can in any way come to grief.

No appreciable difference in definition is visible in prints printed with different sides of the transferred negative in contact with the sensitive surface; but, theoretically, it would seem that a sharper impression could be obtained from the negative when reversed, as required for use in connection with many of the mechanical printing processes, because the image formed in the original collodion film, without intervention of any film of varnish, gelatine, or collodion, is in contact with the sensitive surface.

One or two points worthy of remembrance in connection with the process were mentioned by Mr. Woodbury. The first relates to the intensity of the negative. It is customary, in ordinary operations, to carry the intensification a stage further than is required for printing, because it is generally somewhat reduced by the final varnishing. Most operators like to see the negative, when finished and wet, present to the eye just the proper amount of intensity. On drying, this is considerably increased; and on varnishing, again reduced to about the condition of intensity possessed by the wet negative. As, however, neither the coating of gum, nor the final layer of collodion which is to form the substitute for glass,

in any degree reduces the intensity of the image, it is important to avoid obtaining too much density in the producing the negative.

A second point requiring great care is the levelling of the negative before pouring on the thick film of collodion, otherwise an uneven and unsatisfactory layer is irremediably produced. And, finally, it is of vital importance, after the combined films are removed from the glass, to lay the transferred negative they form between sheets of clean blotting-paper, and allow them to dry under a weight. If removed whilst still in any degree damp, they are apt to cockle, and no subsequent treatment will make them lie perfectly flat.

VARNISHES FOR NEGATIVES.

THE *Photographisches Archiv* contains some remarks on varnishes by Herr Bienert, in which he expresses a conviction that cracking of the film and varnish is more frequently due to keeping the negative in an apartment subject to changes of temperature than to imperfection in the varnish. He recommends the following formula, stated to be that of Herr Haefstangl. We may remark, in passing, that it appears to us that a varnish so made would be scarcely so hard as the best varnishes in the market. The alcohol employed is to be strong, but not so strong as to dissolve the collodion film. The specific gravity should not exceed 817.

Alcohol	2 ounces
White shellac	100 grains
Venice turpentine... ..	20 "
Gum sandarac	10 "
Gum mastic	5 "

A varnish which may be used with very little heat, but is unsuitable for carelessly kept negatives, subject to changes of temperature, stands thus:—

Turpentine (common) ..	$\frac{1}{2}$ drachm
Venice turpentine	$\frac{1}{2}$ "
Gum sandarac	2 $\frac{1}{2}$ "
Sugar	3 grains
Camphor	2 "
Alcohol	2 $\frac{1}{2}$ ounces

We fear that the film given by such a varnish will very easily scratch.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

A PHOTOGRAPHER'S PROVIDENT SOCIETY—PHOTOGRAPHER'S PERSONAL LUGGAGE—TRANSFERRED NEGATIVES—BLUE GLASS IN STUDIOS—INDIA-RUBBER FOR MOUNTING—TOUCHING NEGATIVES—ENCAUSTIC PASTES—SOCIETIES.

I HAVE often wondered to what singular cause the fact was due that, notwithstanding the repeated discussions which have occurred on the importance of establishing some Provident Fund, or Benevolent Society, or combination of both, for the relief of the aged, the sick, or unfortunate amongst photographers, so little practically—in fact, nothing—has yet been effected. It cannot be that any notion exists that photographers possess immunity from the ills of life; it cannot be that less care prevails amongst them for the sufferings of their fellows; it cannot be that as a community they are too poor to establish a fund for the relief of each other; it cannot be that they are not sufficiently numerous to require a separate provident or benevolent organization on their behalf; it cannot be that there are not sufficient intelligent and capable men amongst them to carry out such a purpose; surely it cannot be, as some assume, that the men most capable of carrying out such a scheme are the least likely to need its aid, and are too supine to take action in a matter which does not touch their immediate interests.

Possibly some light may be thrown on the question if I record some observations I recently heard in the course of a conversation on the subject amongst some photographers.

"It was a fatal mistake," remarked one, "that the first appeal to the benevolence of photographers should have been made for an individual instead of a general cause. If the same effort had been put forth for the relief of all the needy and deserving in the photographic community, it is likely enough that a very large sum would have been secured at once, which, augmented by annual subscriptions, might, if carefully administered, have met with some efficiency all cases of need for years to come. Unfortunately it was not so, and the trouble which those having charge of the Goddard Fund seem to have had with the recipient himself and with his executors, and the attempts to cast discredit on their conduct by men of no credit, will probably check many in any effort to establish a general fund."

"The expenditure of so much effort for an individual fund was clearly a mistake," rejoined another; "but it is easy to be wise after the event. But the aim was a good one, and the troubles in the way could not have been anticipated. As for the attempt to malign those who did the work in the Goddard business, I should hope that no men of sense would be deterred from doing a good thing because of the snarling of two or three pariah curs."

After some further conversation, another gentleman remarked: "The real difficulty is a common one: what is required is, a beginning. Many will be willing to work and give when once the thing is begun, if the project be begun under satisfactory auspices. If a committee of a dozen trustworthy men were formed, with an active secretary, or two secretaries, also men of standing and reputation in the profession, I feel satisfied the project would soon become a success. Find the men willing to take the first steps, and all required steps will soon follow in due course."

I must confess that I am much disposed to agree with the last quoted speaker. Who will begin? Perhaps none is so fit as the long established editor of a long established journal. Will our Editor, the first projector of such a scheme, undertake the duty, and at once invite subscriptions?*

The somewhat interesting question recently raised, "What is personal luggage, photographically considered?" possesses, like most questions, two sides. It seems undoubtedly natural enough, at first sight, to say, that provided the proper weight has not been exceeded, it cannot be a matter of consequence to the company whether the luggage consists of photographic apparatus or of boots and tooth-picks; yet, on second thoughts, it is clear that it does matter much, as two of your correspondents last week illustrate. It is, I fancy, pretty clear that the photographer ought not to claim compensation for broken nitrate baths. Such things would require, as a rule, much greater care in transit than a trunk of clothes; and if, when treated in the same manner as the latter, a bath breaks, it does not seem unnatural that it should be at the photographer's own risk. If the nitrate solution running out of such broken bath leak into some case containing a lady's valuable wardrobe, from whom should she recover compensation—from the company, or from the photographer?

I have recently seen some of the negatives transferred by the process Mr. Woodbury described a short time ago in your pages. Nothing could be more perfect or convenient for use; they were quite sufficiently stout to be convenient for use—limp and elastic, so that there was little risk of cracking or scratching them, and wonderfully convenient for storage, besides possessing the especial advantage, in

* We scarcely agree with "An Old Photographer" here. A journalist has rarely sufficient leisure to permit him to undertake such duties and responsibilities. Our sympathy and aid may always be calculated on in such a matter; but we have long made it a rule not to accept the charge of moneys in any such case. Besides, the first step is organization, in the course of which a treasurer will necessarily be appointed. If necessary, we will, at all times, aid in transmitting money to such an officer, but we cannot undertake his office.

relation to photo-engraving processes, of permitting either side of the negative to be placed in contact with the sensitive surface. I fancy that the time will come when the use of transferred negatives will be much more common than it is now.

I have noticed recently a tendency to revive the question of the advantages of blue glass in studios. I see from your pages that an elaborate paper was recently read before one of the German photographic societies on the subject, giving countenance to the notion that some advantage was to be gained by its use. I should not like to be guilty of discourtesy or dogmatism, but I cannot help remarking that this seems to me one of the greatest absurdities ever propounded. White glass admits all the rays of light, the blue, or most actinic ray, amongst the rest; blue glass only admits the blue ray; but it does not admit of anything which the white glass excludes, nor can it exclude anything which can be injurious: whence, then, the advantage? If I have a sovereign and a handful of silver, and copper besides, I am surely richer than if I had only the sovereign. If the other rays which go to form white light had any injurious or retarding effect, something might be gained by excluding them; but nobody has ever pretended that the other rays were injurious. It is known, on the contrary, that although blue is the most actinic ray, some of the other rays have also a degree of actinic power. Whilst nothing is gained by the use of blue glass, I am not equally sure that something is not absolutely lost in rapidity, besides the displeasing and gloomy effect of the blue-lighted studio.

My experience decidedly confirms that recorded in the News as to the uselessness of india-rubber for mounting prints. From the large number of examples I have already seen in my own possession, and in that of others, curling off the card, I am satisfied that it is most untrustworthy as an adhesive material, or as a "mountant," as some would affectingly phrase it. I have not tried it as a means of preventing negative films cracking, but I have used it as a preliminary coating for dry plates. So far as my own observation is concerned, it has not suffered any change when used in this way.

Since you first introduced the practice of touching negatives with black-lead pencil to English photographers, I have frequently used it with advantage, and where light, delicate touching is required, I desire nothing better; but I recently saw in the studio of a friend a bottle of the mixture recommended in your pages a short time ago by Mr. Bell, I think, consisting of silver precipitated from a nitrate solution by means of pyrogallie acid rubbed up in essential oil of lavender as a vehicle. The negatives touched with it were admirable; the touched spots were so perfectly homogeneous in colour and material with the deposit of which the substance of the negative was formed, that nothing could possibly be better; and my friend assured me that it was the most pleasant mixture to work with upon a varnished negative which he had tried.

In the preparation of encaustic pastes the use of a large portion of an essential oil as a solvent for the wax will generally be found, I think, preferable to the use of benzole only, which, by its quick evaporation, renders the task of applying the paste sometimes difficult. Essential oil of lavender—although, apparently, from its strong perfume, a very volatile material—is not so in fact, and answers admirably as a somewhat slowly evaporating solvent for such materials as wax. Paraffine, I find with you, does not answer.

Many of the societies will commence their sessions before I write again; and so far as the London societies are concerned, all, I believe, with prospects for activity and interest. I hear of good papers on the *tapis* for each of these already. Next month I hope to speak of their performance instead of their promise.

Foreign Miscellanea.

M. Bisson has recently made a second ascent of Mount Blanc for the purposes of photography, and has been exceedingly successful in his results. When he made his first ascent, several years ago, he was so hampered with the large apparatus, dark tent, and necessities that he was compelled to take for working the wet collodion process, that the undertaking proved to be one of serious difficulty and enormous expense; the obstacles to be overcome, the large body of guides and porters requiring control, and the cares and troubles inherent to the wet process, were subjects demanding the possession of great courage and skill on the part of M. Bisson. When Mont Blanc was scaled a second time by this intrepid photographer, the circumstances under which the ascent was made were very different. M. Bisson provided himself with a stock of dry plates prepared by MM. Léon and Lévy (the successors of MM. Ferrier and Soulier), according to the albumen or collodio-albumen processes. Four views were taken from the summit of the mountain, the whole number of plates exposed at different points of the route being from sixty to eighty. The negatives were developed by M. Lévy on the return of M. Bisson to Chamounix, when the success of the expedition was found to be most complete.

In some of the Paris theatres are sold photographic programmes containing portraits of the principal actors. The cards of this description sold at the Variétés, during the performance of Offenbach's "Bridge of Sighs," were five inches high by three broad, and contained, in three rows, twelve ovals, of which eleven were filled with portraits, and the twelfth with the title of the piece, &c.; at the back were advertisements, and the names of the leading photographers of Paris. The cards are to be purchased inside the theatre for the sum of one franc.

A German journal states that the reproduction of summer freckles on the face may be prevented in portraiture by the sitter briskly rubbing his features until they are red.

MM. Geymet and Alker are the authors of a book entitled "Emaux Photographiques," at present in the press. The work treats of all the formulae, operations, and hints necessary to the production of photographs upon enamel. It likewise gives details for preparing the enamel, the method of retouching the pictures, causes of insuccess, &c.

The *Bulletin* publishes in *extenso* M. Davanne's report upon photographs and photographic necessities exhibited at the Paris Exhibition of 1867.

In the *Photographische Correspondenz*, M. Alois Nigg discusses at some length the best method of lighting studios, and criticises Dr. Vogel's remarks in reference to the height at which a glass roof should be built.

M. F. Lamberg, of Odessa, recommends the following gold-toning bath for albuminized paper as being durable, rapid, and economical. Two solutions are made as follows:—

- 1.—Double chloride of gold and
 potassium 1 gramme
 Water... .. 400 grammes.
- 2.—Phosphate of soda 2 grammes
 Acetate of soda 20 "
 Fresh chloride of lime ... 1 gramme
 Water... .. 1600 grammes.

The first solution is added slowly and by degrees to the second. This gold bath will be found to preserve the whites perfectly pure and beautiful.

The *Archiv* states that a very beautiful gloss may be given to photographs by first polishing them with wax dissolved in ether, and afterwards coating them with an alcoholic or enamel varnish.

Dr. Jacobsen recommends the following method of clarifying shellac varnish. He states that besides the soluble resin which may be dissolved by cold alcohol, shellac likewise contains a waxy material, soluble only in hot spirits of wine. If, therefore, a solution of shellac has been prepared in boiling alcohol, the liquid will, on cooling, become quite turbid, owing to the minute particles of wax in suspension; the solution may be cleared by allowing it to stand for some time in a cold locality, and then filtering it through felt or filter-paper. The durability of the filter may be increased by the addition to the solution of very finely-ground glass. If it is desired to bleach the solution, it is boiled previously to filtration, for a short time, with freshly burnt bone-black, and then allowed to become perfectly cold.

M. Grasshoff recommends the coating of prints with normal collodion, and, when this has dried, the further application of an alcoholic varnish by means of a broad camel's hair brush; if the varnish is poured upon the picture instead of being applied with a brush, the effect produced is not so brilliant. If it is desired to retouch the print with water-colour, M. Grasshoff suggests that this operation should be carried out after the collodion has been poured on; by this means the retouching is easier to perform, and the print may afterwards be varnished either with dammar, mastic, or copal oil-of-turpentine varnish, prepared by mixing equal parts of oil-of-turpentine and commercial varnish. Pictures thus treated require from one to two days for drying.

In reference to colouring of photographs, the Hamburg correspondent of the *Archiv* states, that if the colours are rubbed on the palette with gum, and then applied to the photograph, the latter will, after being varnished with collodion, appear very much as if it had been painted in oil. Many photographs finished in this way are sold, says the correspondent, as veritable oil-coloured photographs, which, however, have never seen any other oil than that in the lamp by whose light the artist has painted them.

For facilitating the application of water-colours to the albuminized print, the same correspondent recommends a coating of the following mixture:—

Absolute alcohol	...	...	...	8 parts
Ether	...	...	...	4
Gum, dissolved in a little water	...	...	...	1-16th
Glycerine	...	...	...	1-8th

By applying powdered colours to albuminized prints which have been varnished with a solution of wax in oil of lavender, in the manner in which Daguerreotypes are coloured, a very beautiful effect may be obtained, resembling very much a picture upon porcelain.

M. J. Wothly, of Aix-la-Chapelle, recommends the employment of ordinary hydrochloric acid instead of a soluble chlorine salt, in the preparation of collodio-chloride; by substituting the agent in question a finer precipitate of silver is said to be produced.

M. de Constant states that he has obtained very good results with M. Carey Lea's bromide of silver collodion, by substituting balsam of Tolu for tincture of aloes.

Dr. Liesegang publishes in the *Archiv* a very interesting account of a visit he paid to Mr. Woodbury's establishment during his recent sojourn in London.

M. Béchamp publishes an interesting paper in the *Comptes Rendus*, the result of a long investigation into the circumstances of the decomposition of eggs and their liability to spontaneous alcoholic and acetic fermentation.

The *Zeitschrift für Analytische Chemie* recommends the following method of detecting hyposulphite of soda, which is so delicate that if the latter is contained in a solution in the proportion of 1 part in 500,000, its presence is at once discovered. A few small pieces of aluminium wire (which is preferable to zinc, as being more likely to be purer) are added to the solution to be tested, together with a little dilute

hydrochloric or sulphuric acid, and the mixture is then warmed slightly; if hyposulphite is present, lead-paper becomes blackened after an interval of at most five or ten minutes. As the aluminium dissolves but slowly, the wire may be afterwards washed and put aside for further experiments.

The *Correspondenz*, in alluding to Mr. Spiller's paper on the presence of hyposulphites in mounting boards, remarks that some time since MM. Szekely and Massak caused a large quantity of mounted and unmounted photographs, produced at the same time and in the same manner, to be stored away for the purpose of ascertaining their keeping qualities. After an interval of some time the prints were examined, when it was found that the unmounted copies were still in a perfect condition, while those on cardboard betrayed all those symptoms which are regarded by photographers as evidence of fading.

The same paper warns its readers against a certain process-monger, who claims to be a cousin of the MM. Angerer of Vienna, and assumes the name of those gentlemen; he states that he has worked for some time with Mr. Woodbury, and is anxious to effect the sale of that gentleman's process. He likewise endeavours to dispose of formulae for making cheap sensitizing baths, the following recipe being one for which he charges the sum of forty-five shillings, viz.:—

1.—Water	...	...	...	8 ounces
Nitrate of potash	...	...	...	1 ounce
Nitrate of uranium	...	...	...	7 grains
Ammonia	...	...	...	3 drops.
2.—Water	...	...	...	9 ounces
Acetic ether	...	...	...	20 drops
Nitrate of silver	...	...	...	1 ounce.

When both solutions have been made, they are mixed together.

SHORT ESSAYS ON PHOTOGRAPHY AND ART.

No. 4.—"ON DISTORTION AND PERSPECTIVE."

BY NELSON K. CERRILL.

A VERY ingenious artist, who, by the-way, gets his living by photography, tried the other day to argue me into the belief that all photographs are wrong. And the reason for their wrongness was, he said, that you could never get so far from the subject you were taking, as to avoid distortion in the lines or exaggeration in the perspective. It is quite evident to my mind that this gentleman was under a great misapprehension as to the real state of the case, and, in consequence, his remedy for distortion, or bad perspective, was not one calculated to prove of much avail, and I propose to open the subject in the present chapter in order that it may, if needed, be ventilated by others whose opinions will be of more value than my own. I will first premise that though exaggeration of perspective may, when carried to great excess, produce distortion, when speaking strictly, distortion should be considered as quite apart from perspective; it may occur in many other ways, as from the lens giving curved lines, and not a flat field, and so on. Properly speaking, then, the difficulty which my artist friend had stumbled against was one of perspective only, and I purpose to treat it as such.

So far from wishing to avoid the effects of perspective, I greatly rejoice in them, because I consider that "relief" is as much, or almost as much, to be obtained by it as it is by light and shade; but it is said that any part of the figure—as the hand, for instance—being projected at all towards the lens in taking a picture, is too much enlarged, and that when, on the other hand, any part of the figure is behind the rest, it is in turn too small. That when the hand is held forward it is *large*, and when held back it is *small*, is a matter almost too obvious to need mention; but it is as to the degree of this enlargement or diminution that I would direct attention. It is, I contend, not essentially and necessarily wrong

to have the hand either on an enlarged or a diminished scale; it may be so in fact, and facts are not always wrong.

The best way to consider the matter will be to take an example. Thus, stand before a looking-glass at twelve feet distance: for all practical purposes, the image that you see of yourself reflected in the glass is just the same as would be seen by a spectator at a distance of twenty-four feet (the image reflected being always, apparently, as much behind the reflector as the real object is in front of it). Now close the hand, and put it up by the side of the face, and note exactly its apparent size as seen in the glass; next stretch out the arm to its full extent towards the glass, and note how much larger it is now in proportion to the face than when held up close to the head. From this it will be seen (as, indeed, it did not require much showing) that as an object approaches the eye of an observer (or, which is the same thing, the lens of a camera) it is increased in size, and, therefore, it cannot be said to be wrong to represent it as larger. Now let us continue our experiment with the looking-glass. Let us go only six feet off instead of twelve, place the hand again by the side of the head, and it will still maintain the same proportionate size to the feature as it had in the first instance. Not so, however, when it is again extended to the glass, for now it is apparently larger than it was before, even larger in proportion than when held forward from a greater distance. The same experiment being repeated from a much shorter distance will show the same result in a more marked manner, so that it will be quite evident that the nearer any object is to the eye of a spectator, so much greater will be the apparent enlargement of any part of it which is projected forwards. And thus it will be seen that it cannot be wrong to represent the nearer parts of a picture larger in proportion than those which are more remote.

But then there is another matter to be considered, namely, the relation of the amount of apparent increase in the size of projecting portions of the figure and the focus of the lens producing the picture; and here I venture to think a mistake is commonly made. Long focus lenses, requiring to be placed at a considerable distance from the sitter, will produce less apparent enlargement of projecting parts than one of short focus, which will have to be brought very near the sitter; but at the same time I apprehend that in any case, the amount of enlargement will bear the same relation to the focus of the lens as it does to the distance between the observer and the object seen. This is evidently the case, as with short focus lenses the apparent enlargement is always more than with long, and in just the proportion which may be observed in the looking-glass experiment. It must always also be remembered, that there are two things besides the true effect of perspective, which tend to increase the apparent enlargement of prominent parts of the figure. If any part of it comes out of focus it will be inevitably enlarged beyond the proper degree due to the projection; and if, though still in focus, there is any movement, the same effect will take place. These two cases need not, however, be taken into consideration, because they are merely the result of bad technical photography, and it is not my object to defend bad work, but only good.

There are now a few very important points to be considered.

Firstly, what is the proper relation between the focus and the lens, and the size of the picture? It is evident that much depends on this, for if the enlargement of near objects must take place, and if the proportionate amount of this enlargement is dependent upon the length of focus of the lens employed, it seems evident that one lens must be better adapted than another for the pictorial rendering of any subject; all lenses may be mechanically right, but all may not be so good practically. A short focus lens seems most suitable for small pictures, and one of long focus for larger ones; and I think that probably that focus lens which needs to be placed at the same distance from the plate as the eye is from the picture, when seen to best advantage, is the one best suited to each particular size; this may be open

to some exception on part of short or long-sighted people, but, as a rule, I think it is correct.

Another point must not be left unmentioned. If it is at times a disadvantage to find portions of the picture enlarged, there ought to be also occasions on which this peculiar property of perspective might come into very valuable service; as if, for instance, a hand is too large in nature, it may be reduced by being kept in the background, and the same with a figure of "rude" dimensions in a group.

There is also another curious point: the necessity to avoid exaggerating the natural perspective (if one may so call it) which exists in almost every face; in almost every face the mouth and the eyes are converging, not parallel, as one would suppose, but the mouth is almost always rather up at one corner and down at the other, or else the eyes are not quite straight with the two lines of the mouth. If, then, a three-quarter face portrait be taken, looking the wrong way of the face, the most absurd result will follow; though the near side of the face will, by the law of perspective, be the larger, the actual distance between the eyes and the mouth will often be greater in the side of the face remote from the camera than in the side nearest to it, so that almost a pseudoscopic effect will be produced; this is wrongness and false perspective, if you will; but to make those objects which are nearer the camera larger in proportion than those which are behind is not a fault at all, but a most necessary consequence of true perspective, without which pictures would look as flat and unrelieved as do objects seen at a great distance.

ON GILDING GLASS.*

The gilding of glass is by no means so certain a process as that of silvering, inasmuch as there exists at present no efficient method for applying gold to a vitreous surface. The Liebig process, in which an alkaline solution of gold is reduced by means of a mixture of spirit and ether, is somewhat uncertain in its results, and by no means so efficient as the earlier method of Wernick, which has been simplified by Professor Bottger in the following manner:—

Three solutions are prepared, all of which are endowed with good keeping qualities, and are mixed together in certain proportions previously to their employment.

No. 1.—One gramme of fine gold is dissolved in *aqua regia*, and the solution placed in a water bath to evaporate, for the purpose of separating the superfluous acid; it is afterwards diluted with water to the extent of 120 cubic cents. A better plan, perhaps, is to dissolve $1\frac{1}{2}$ grammes of chloride of gold in 120 cub. cents. of water. It is necessary that the gold solution should be absolutely free from any metals which are precipitated by the reducing fluids—as, for instance, silver; if the chloride of gold contain a trace of chloride of silver, the greater part of the gold is precipitated in the form of powder, and the thin coating of gold very soon becomes dissolved from the glass. A slight trace of acid in the chloride is less injurious.

No. 2.—Six grammes of caustic soda dissolved in 100 cub. cents. of water.

No. 3.—Two grammes of ordinary grape sugar are dissolved in 24 cub. cents. of alcohol, of 80 per cent. strength, and 24 cub. cents. of commercial aldehyde of 8.870 specific gravity are afterwards added.

If this reducing fluid is kept longer than a day its action becomes weaker.

The fluids are mixed immediately before employment in the following manner, viz., of No. 1, four volumes; of No. 2, one volume; and of No. 3, one-sixteenth of a volume. The mixture quickly assumes a greenish tint, owing to the gold becoming precipitated. The glass to be gilded is cleaned first with soda lye, and afterwards with alcohol, but on no account is any acid to be used, as in that case the gilding is very liable to leave the glass again. The

* *Photographisches Archiv.*

liquid is poured into a flat dish, and the glass plate to be coated is placed upon two strips of glass in such a manner that the liquid covers only the thickness of the plate. When the gilt surface has been produced, it is carefully rinsed with water, and placed in a sloping position against the wall upon blotting-paper, prepared side innermost; it is then allowed to dry in an atmosphere of ordinary temperature.

The greater portion of the gold remains behind in the bath in the form of light flakes in suspension; this is filtered off and heated, and may be again converted into chloride of gold.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER XXXVI.

One of the most effectual means of impressing truths on a pupil's mind is to reiterate them again and again from many points of view. It is for this reason that I have introduced several illustrations showing how the pyramidal form—that of most use in figure composition—has been the ruling idea in the several artists' minds in the construction



of their groups, and how no group is allowed to exist without a contrasting balance or support. These principles are further plainly illustrated in the wood-cut from Elmore's fine picture of the "Invention of the Stocking Loom." The fault of the picture, in the eyes of some critics, is that the subject is not sufficiently evident, but requires explanation. This, in my opinion, is a very small matter, although it certainly is an advantage when a picture explains itself, and does not necessitate any reference to a catalogue. If I went into a description of the details of the composition I should only be repeating what I have said of other groups; I will therefore pass to an extension of the same principles in a more complicated subject.

Everybody knows West's great picture of the "Death of General Wolfe;" I have therefore not thought it necessary to occupy space with a large illustration of it, but content myself with a diagram of the leading lines, which will bring its various parts to the recollection of the student. This picture is a very perfect example of a hollow group, or circular composition, so called from the figures and objects forming it being placed nearly on the circumference of a circle, and which arrangement is applicable to the highest works of art, from its simplicity and extensive sweep, and to the lowest, from its being finely adapted for the purposes of light and shade.

Mr. Lake Price has carefully analysed this picture in his lessons on composition in the early volumes of the PHOTOGRAPHIC NEWS, and as the volume containing it has become scarce, I cannot do better than avail myself of his analysis of the composition.

"We observe the stricken hero prostrate in the centre of the picture, the sympathy of his officers and soldiers in the fall of their general being well expressed. The 'red man,'

hard of nerve himself, looks on with interest to see the resignation of the white chief to his fate; whilst the cry from the battle-field, 'They run! they run!' is perfectly given by the panting figures on their right, and the more episodal



one in the distance. The arms of the pointing figures cross each other, thus composing. The animated figure of the trapper or huntsman is most necessary, and gives the foil and sentiment to the still repose of the group immediately round the dying man. The grenadier, standing rather apart, judiciously separates the grouping, and prevents it being monotonous and crowded. The colours and their straight staff carry up and break the top line of the composition, and give value to the action. The advancing figure is prevented over-balancing by the crouching Indian beneath,

which makes a mass with him. The balancing line of the Indian's gun cannot be dispensed with, though the artist has judiciously broken it by the intervening knee; nor the cap of the grenadier on the ground, which composes with the lines of his figure, and completes the group; whilst the dark hat under Wolfe finishes the circle, and gives distance to the lighter parts behind. The gun on the ground completes the base-line carried through the foreground. This is a most perfect composition, and should be well studied. We have first the story, told in a touching and distinct manner; next, we have the main lines, traversing the subject horizontally, balancing each other, whilst the lines of the figures, as seen in the analysis, reply perfectly, and balance with each other; at the same time each figure either composes with its own base, or forms part of another mass, the whole arrangement, in its linear composition, being admirably susceptible of subsequent chiaroscuro."

It was with this picture that common sense in historical painting in England commenced. Before this period the most ridiculous absurdities were perpetrated in the costume, not only in historical pictures, but in every other class of painting. The picturesque dress of the day was thought too barbarous for the sham classical taste of the time of James the First. This taste, revived by Verrio and Laguerre, was in the height of fashion when West commenced his "Death of General Wolfe." A portrait painter seldom allowed his sitter to appear in his own dress; if his subject was a lady, she was transformed into a shepherdess with a spud in her hand, tending sheep in Arcadia; if a youth, the distinction of sex was indicated by giving him a crook instead of a spud, and pandean pipes in his hand. Men were dressed in armour of an earlier period, and it appeared to be a law as binding as those of the Medes and Persians that in historical subjects (which should be treated allegorically, if possible) the figures should be dressed in Greek or Roman costume, or not so much the costume of the actual Greeks and Romans, as a dress in which they were supposed to appear. If a battle-piece was represented, the king or general, "the noblest Roman of them all," was set in the front, bearing no possible proportion to the rest of the combatants. Thus, if the dubious costume were to be believed, actions of Englishmen in the seventeenth and eighteenth centuries were performed by the people of extinct nations. But to make the thing still more absurd, although the dress was exchanged for Roman armour, the enormous wigs of the period were retained! Fine examples of this false classicality are to be found in the statues about London, especially in Westminster Abbey and St. Paul's Cathedral, where, by-the-bye, there is evidence of a further decadence in artistic truth; the classic heroes of the early Georges were at least dressed, if dressed absurdly; but passing by Dr. Johnson and others who are wrapped in blankets, we come to the monuments erected to the memory of those who fell at Waterloo, and find that some of them, with that enthusiasm which disregards appearances or cares for uniform, actually went into battle *in puris naturalibus*, without any clothes at all. West, much against the advice of his friends, dismissed this pedantry, and restored nature and propriety in his noble work. Cunningham, in his life of West, speaking of this picture, says:—"The multitude acknowledged its excellence at once; the lovers of old art, the manufacturers of compositions called by courtesy classical, complained of the barbarism of boots, and buttons, and blunderbusses, and cried out for naked warriors, with bows, bucklers, and battering-rams." Sir Joshua Reynolds was so blinded by the fashion of the time that he entreated the artist to recollect the danger which every innovation incurred of contempt and ridicule, and urged him to adopt the costume of antiquity, as more becoming the greatness of the subject than the garb of modern warriors. West's answer was, that the same truth which gives laws to the historian should rule the painter; if, instead of the facts of the action, fiction was introduced, what would posterity think of the truth of

the painter? Reynolds afterwards acknowledged, when he saw the completed picture, that the artist was right: "West has conquered," he said to a friend; "he has treated his subject as it ought to be treated. I foresee that this picture will not only become one of the most popular, but will occasion a revolution in art." At that time, truth of effect in art was so little regarded that Garrick thought it right to play Macbeth in a full court suit, and murdered Duncan in a bag-wig with a dress-sword!

I have gone at such length into this subject in order that I may point out a similar error in our practice of to-day—one not so glaring and absurd as the classical armour appears to us now, but which seemed quite right to our ancestors, but one which is but a new application, only in a less degree, of the same error—I mean the practice of dressing a sitter for a portrait in fantastic garments, for the purpose of making him up into a picture. The object of portraiture is to make a resemblance of a man as he is, and very little liberty should be allowed or taken in doing it. I am not now speaking of photographs of which the object is to make a picture apart from portraiture—in these anything may be done, so that general truth is observed—but a portrait professes to represent a prosaic fact, and should fulfil its function.

ON THE EMPLOYMENT OF COLLODIONIZED PAPER.

BY LUDWIG SCHIRANK.*

THE introduction of carbon printing, causing as it did so great a stir in the photographic world, and giving rise to the hope that by its means perfect durability might be obtained, has for a time distracted attention from the endeavours which have been made to substitute gun-cotton, or rather collodion, for albumen in the printing process. The gentleman to whom belongs the honour of having first introduced collodion as a material for printing is the celebrated German experimenter, M. Wothly, of Aix-la-Chapelle; for although at an earlier date developed collodion positives were transferred to chalk and gelatine paper, still we believe that in M. Wothly's uranium printing process collodion was employed for the first time as a sensitive coating for paper in the form it is used to the present day.

The failure of the uranium printing process was partly owing to the fact that the consumer himself was expected to prepare his own sensitive material by coating the paper with collodion, a manipulation requiring, of course, more care and attention on the part of the operator than is demanded in the employment of albuminized paper.

For the same reason Mr. Wharton Simpson's collodion-chloride process, during the early days of its existence, made but little progress, until several manufacturers introduced into commerce the sheets of paper ready collodionized.

But even now that collodion paper is obtainable in commerce, photographers are slow in adopting it, and not until it is more generally known that the carbon process is ill adapted for universal practical employment will attention again revert to the old methods. It must be admitted by every impartial observer that the prints upon collodion paper greatly surpass in brilliancy and detail the albuminized picture, and these qualifications, although possibly of no importance in large pictures, are invaluable in prints of lesser size, viz., in stereoscopic, microscopic, and other reproductions in which fine details are depicted. Of these advantages must every practical photographer be aware; and yet on many sides has the introduction of collodion paper been prevented. The first reason for this we have already touched upon, namely, the hope that the carbon process would bring about a total reform in the process of printing. The second reason was that the manufacturers of the collodion paper were at the commencement not perfectly *au fait*

* Photographische Correspondenz.

at their work, and furnished a material, therefore, which was of such mediocre quality that photographers who had resolved to give the new product a trial were at once frightened away altogether. The paper possessed all the faults inherent to glass plates coated with collodion, such as streaking and fogging caused by the bursting of collodion bubbles, these faults giving rise to dark spots whenever the paper was printed. Besides, the collodion employed for coating was often of unequal composition, and the paper not sufficiently glazed, so that pictures were sometimes produced upon the collodion paper which were inferior in point of brilliancy to those furnished by good albuminized paper. At another time a whole batch of the prepared paper was sent into the market, and became unserviceable after a short time, owing to the addition, during its manufacture, of too large a quantity of resin.

M. Obernetter, of Munich, who has built a factory on purpose for the preparation of collodionized paper, experienced with his first products, made at the new manufactory, the greatest difficulties, arising, in his opinion, from the damp walls of his workshop. The paper when freshly prepared was perfectly good, but after a fortnight, or three or four weeks, a change came over the material, and rendered it quite unserviceable. For some time he was unaware of this serious evil, and every batch was tested, and being found of proper quality was at once sent off; but in a short time from every part of the world came complaints. As soon as the cause of injury was discovered, the workrooms were continuously heated, but without result; and it was not until the heat of the summer had perfectly dried the walls of the factory that the evil disappeared of itself.

"I have found out," wrote M. Obernetter to us at the time, "that the application of a preparation of gutta-percha prevented the peeling off of the film and its liability to become damaged, and at the same time increased the durability of the picture to such a degree that sulphuric acid or a solution of cyanide of potassium might be poured upon the prints without injuring them in any way."

All these experiences are undoubtedly of value, although it is to be deplored that they were acquired so late and at a time when many photographers had relinquished their trials of the material. A third cause of failure was due to the employment of old used-up gold and hyposulphite baths of the ordinary strength in the manipulation of the collodion paper, a course of proceeding adopted in direct opposition to the directions given by the manufacturers, who stated distinctly that no other solutions than those indicated by themselves should be employed; the consequence was, that in many cases the sensitive film was found to become detached from the paper during the processes of toning and fixing. Although we have on a previous occasion already made known the instructions drawn up by M. Obernetter in regard to the employment of collodion paper, we consider it desirable to recapitulate the same with a few important additions.

Instructions to be Observed in the Use of Collodion Paper.

The printing is to be done in the shade, the pictures being copied to a degree but slightly more vigorous than that desired for the finished print.

The toning is conducted by placing the prints first of all in ordinary water, without addition of common salt, to remove the superfluous nitrate of silver; three changes of water in a quarter of an hour will be amply sufficient. The toning bath is most conveniently made by keeping in stock two solutions, thus composed:—

1.—Distilled water...	50 ounces
Sulphocyanide of ammonium...	40 grammes
Hyposulphite of soda ...	3 "
Bicarbonate of potash ...	1 gramme.

If the gold compound used is neutral, the last-named may be suppressed.

2.—Distilled water...	50 ounces
Pure chloride of gold ...	2 grammes.

By chloride of gold is meant a pure compound, free from acid and water, and not salts of gold; if the latter is employed, about double the quantity should be taken, as it contains but half the amount of gold. If, after five minutes' immersion in the gold bath, the pictures still remain red, and do not assume a beautiful violet tinge, there is not sufficient gold present, and more solution must be added until the prints tinge quickly; the bath must on no account give an acid reaction.

Both solutions are endowed with good keeping qualities. For use they are mixed in equal proportion, only so much being taken as is required for immediate employment. In this way a couple of pictures may be at once toned without delay in quite as economical a manner as a large batch; moreover, no chance of the prints becoming yellow need be feared by using these solutions, for it is this bath, and this only, that can be relied upon for the production of faultless pictures. Other baths have a tendency to dissolve off the film of collodion.

When the prints have attained the desired tone, which occurs in from two to ten minutes, they are washed in ordinary water, and fixed in a solution which should be compounded exactly in the following proportions, viz., 40 grammes of hyposulphite of soda dissolved in 32 ounces of distilled or ordinary water. The fixing will be completed in five or ten minutes, and then a subsequent washing of two to three hours will suffice to remove the weak solution of hyposulphite.

In all the manipulations care must be exercised not to bend the paper or to injure the surface with any sharp instrument, as by this means the collodion is easily torn; no cutting or trimming should be done before printing. When the prints are laid in the first water bath, after their exit from the pressure frames, they are inclined to curl themselves up: this is of no material importance, and if they are laid, face downwards, in the toning bath, they again become straight in a few minutes. Too many prints must not be allowed in the toning or fixing bath at the same time, as red spots are thereby caused. When the pictures have been thoroughly washed, after fixing, it is as well to lay them one upon the other, face downwards, on a plate of glass or clean board, and to press them with the hand, so as to expel the water; they may afterwards be placed in an upright position, so as to drain thoroughly. While the pictures are yet damp they are trimmed and mounted; or, if it is deemed inconvenient to place them at once upon cardboard, they are again heaped upon one another to prevent their becoming completely dry. In order to facilitate the trimming of the prints, it is best to mark upon the negative, either by means of a needle or a black line, the size to which the print should be cut. As a mounting material, ordinary starch paste, freshly boiled, is recommended. Rolling the finished print conduces much to its beauty, and a coating of paper varnish is advisable, inasmuch as the film is thereby protected from injury.

These instructions are so clear that a close observance of them cannot fail to ensure success. Our honoured colleague, Professor August Freund, has nevertheless suggested several improvements which we cannot withhold from our readers, especially as they are designed for producing greater durability, one of the principal arguments in favour of the adoption of collodionized paper in place of that prepared with albumen.

"The rolling up of the picture when placed in contact with water is only to be avoided by employing at first just sufficient water to moisten the print, and, after a few minutes, when the same has become perfectly sodden, to add a larger quantity of liquid. That the sulphocyanide of gold bath only can be used I have likewise found out, although the papers prepared by myself in Vienna some time since could be toned in any ordinary bath. The collodionized paper at present manufactured does not give good results with any toning bath but that of sulphocyanide; and I have likewise found it necessary, besides washing the

prints three or four times to free them from any free nitrate before being brought into the toning bath, to treat them in a mixture of equal parts of spirits of wine and water, to which, for every twenty parts, one part of caustic ammonia is added. The pictures are immersed in this mixture for a few minutes, then washed again in water, and afterwards toned and fixed in the ordinary manner. If this treatment is omitted the pictures are not capable of being perfectly fixed—that is to say, they become altered in direct sunlight.* Although, however, the omission of the spirit bath does not allow of their being perfectly fixed, the prints so produced do not undergo any alteration in diffused light, at least as far as my experience goes, which now ranges over a period of nearly two years.

(To be continued.)

Correspondence.

INDIA-RUBBER, ENCAUSTIC PASTE, ETC.

SIR,—Some very important articles in your paper lately, respecting the use of india-rubber in photography, and also the application of encaustic preparations for improving the appearance of the finished picture, induce me just to trouble you with a few lines on these subjects.

In a paper I read early in this year before the South London Society, I expressed my belief that photographers who used india-rubber as a mountant would find it to their loss, and I have had abundant further evidence, since that time, that such is really the case. Vignettes are speedily stained and spoiled, and other pictures, within periods varying from a few months to a few years. I doubt if anything else is equal to Glenfield starch for mounting pictures on cards; and a very few drops of carbolic acid added to it when made will cause it to keep a considerable time.

I also adverted in the same paper to the use of encaustic paste, expressing a belief that whilst greatly enhancing the beauty of the print, it gave every hope of increased longevity. Wax is one of the most permanent and most unchangeable substances from atmospheric influence, and not only does it contain no element of decomposition within itself, but, from its repulsion of fluids, it acts strongly as a preservative from any deleterious substances from without. It is also unaffected by most chemicals. Previous to Mr. Blanchard's formula of bees-wax in benzole, the encaustic paste made for sale to photographers was far too hard and brittle, often quite chippy. I adopted Mr. Blanchard's suggestion at once, and after adding a few drops of an essential oil, to give a little more elasticity and prevent the preparation drying up too quickly, it was found all that could be desired. You have now given us M. Adam-Salomon's recipe, and a very capital one it is. I made up a supply at once, and had a large number of pictures done with it. Whether it is superior to our former one when properly made with essential oil of lavender is a matter of difference of opinion; those who are employed in doing the pictures say they have no choice, that one applies to the prints just as well as the other. On looking over a hundred pictures of various sizes which have been finished indiscriminately with the two preparations, there is nothing to lead one to a preference, although I confess that on carefully scrutinizing prints done with M. Salomon's encaustic I certainly fancied there was a little more depth given, just a *soupeon* more of liquid transparency than with the other; but after repeated trials of the fairest nature, it was not found that it was possible to pick out from the bulk pictures treated with either preparation, on account of any difference in their appearance. There is no inducement on the part of dealers to adulterate bees-wax; but it is believed that white wax, from its price, is, to a considerable extent, mixed with other and cheaper substances. I have made up M. Adam-Salomon's formula, substituting bees-wax for the white article, and from the result of the last few days' use am rather inclined to look to it as the right thing. If this is manufactured for sale, a good

large bottle should be sold for a shilling, and in a convenient shaped bottle too.

In conclusion, I most strongly advise the use of encaustic paste; those who have begun it are not likely to discontinue, whilst those who have not, have a pleasure in store.

SAMUEL FRY.

WET COLLODION WITHOUT WATER.

DEAR SIR,—In the NEWS of September 25th you give a method of working wet plates without water, and as I have, by a different method, been doing the same thing for more than a year past, perhaps the result of some experiments may interest some of your readers. I had just invented and completed a new dark tent upon small (11-inch) wheels, having the following advantages:—1st. It is so light—only about two pounds upon each hand—that a boy twelve years old can get along as fast with as without it. 2nd. It can be taken to pieces for railway travelling in about one minute, is about the size of a child's perambulator, and can be set up as a dark tent in less than thirty seconds. Having completed the tent, I thought what a useful thing it would be if the wet process could be worked without water, and I set about trying it. Knowing that a negative may remain in contact with hypo soda for many hours without injury, I poured hypo soda solution containing a little golden syrup upon a developed but unwashed plate, and I obtained a negative clear in the shadows, and without any stains; but the decomposition between the hypo and the pure nitrate of silver created a few minute floating particles, which adhered to the plate, and were difficult to remove in the after washing, which was generally postponed until the next day. I next tried chloride of calcium applied to the developed but unwashed plate. This converted the free nitrate into chloride, stopped further developing action, and kept the plates moist. The negatives were clean and bright, but if the chloride of calcium was used too strong, it sometimes produced a little discolouration of the white parts of the negative.

I finished my efforts in this direction by trying a strong solution of common salt, with sufficient alcohol to prevent its running greasy upon the plate, and have used it ever since with perfect success. It stops developing action, and keeps the plates moist for several hours, merely with the addition of a pad of wet blotting-paper at the bottom of the plate-box.—Yours truly,

W. CALLAWAY.

Lucerne Villa, Torquay, Sept. 26th, 1868.

PS.—The salt produces a quantity of chloride of silver upon the plate, every trace of which dissolves in the hypo.

SIR.—With reference to your article, in last week's Journal, on "Wet Collodion without Water," allow me to make a few remarks. Being myself a landscape and architectural photographer, I have for my convenience a eas or portable laboratory, fitted with racks that swing to and fro, so that it answers every purpose of a dark room. I think we are greatly indebted to Mr. Robinson, who has brought out the use of golden syrup. I may mention that I always take a 10 by 12 plate, proceed to my laboratory, and develop it with iron developer as follows:—

Iron	...	...	...	...	120 grains
Liquid ammonia	...	...	...	...	1 to 2 drops
Glacial acetic acid	...	...	...	...	½ ounce.

As soon as I find the picture sufficiently out in detail I pour over a mixture of equal parts of golden syrup and water. I find the syrup stops the action of the developer altogether, and by placing the negative on a rack inside your dark room while you are preparing another plate, you will find it sufficiently drained to place in your negative box, the bottom of which I always keep wet. In this way I have kept plates for a week, and obtained some splendid enlargements, of which you are aware plates must be very clear and transparent to obtain a direct enlargement without any working up. I shall be happy to forward you one of the enlargements from plates a week old, should you wish it.

All that the above requires, after getting home, is to carefully wash, and, if necessary, you may intensify and fix without injury to the plate. I shall be glad to furnish you with further particulars as I proceed.

* Professor Freund's experience here is exceptional. We have prints in our possession produced at the time we first introduced the process, toned and fixed in the usual manner, which have been exposed to sunlight for months without change.—ED. PHOTO. NEWS.

Trusting I have not taken up too much space in your valuable columns—I remain, sir, yours obediently,

Lyham Road, Brighton.

JAMES BLANE.

CARBOLIC ACID.

SIR,—The startling affirmations contained within the letter of your correspondent, "H. O.," last week, are like many other startling affirmations; *i.e.*, more sensational than either reasonable or demonstrable. Having affirmed how carbolic acid proceeds from coal, he says:—"Coal was made in many instances thousands of years before the light of the sun dawned upon this earth." This assertion is totally destitute of evidence in favour of its truth, and is, moreover, as your correspondent will see upon reference to any standard work on geology, enormously improbable.

Further on he says:—"The only light that dawned upon those trees was that of what we call electricity." More and more improbable still, and equally destitute of evidence.

Finally, he asks, "Whether the latent electricity, as contained in coal, from whence proceeds and is produced carbolic acid, is conducive and beneficial to our silver baths?" Until it has been shown—first, that carbolic acid is the peculiar seat, in its latent form, of that electricity which, without evidence, is asserted to have played so important a part at a time in reference to the sun, which neither geology, astronomy, nor common sense indicate as even possible; and, secondly, until electricity, either latent or dynamic, has been *proved* to influence the silver bath, such a question is, I think, as supremely ridiculous as the groundless assertions by which it is preceded.

DIODENES.

Talk in the Studio.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—The first meeting of the session of the Society will be held in Myddelton Hall on the evening of Wednesday, the 7th. Mr. Nelson K. Cherrill will read a paper on the Relation between Intensity and Tone. Various presentation prints will, we believe, be ready for distribution.

ROYAL CORNWALL POLYTECHNIC, FALMOUTH.—The thirty-sixth annual meeting of this Institution opened on Tuesday with more than usually encouraging prospects. In the photographic department there are upwards of two hundred entries, with about double that number of specimens. The local photographers of the West of England contribute well, and with contributors from a distance the exhibition in this branch is the most satisfactory and brilliant display yet made by this valuable Institution. There is a good display of photographs by the Palestine Exploration Society, which have a distinct and peculiar interest of their own. Portraiture, large and small, is well represented. Among the miscellaneous entries of fine art subjects are some brilliant specimens of wood engraving, with a variety of most creditable art specimens from Devouport, Truro, Torquay, Tavistock, Penzance, and Plymouth.

PHOTOLITHOGRAPHIC REPRINTS OF RARE BOOKS.—A society has just been projected in Manchester for the reproduction, by means of photo-lithography, of rare and old illustrated books. The issues for the first year by the "Holbein Society" will consist of Holbein's *Dance of Death*, and Holbein's *Figures for the Old Testament*. Other works of similar interest and character will follow. The subscription will be a guinea a year, entitling the member to the two volumes mentioned, and volumes of similar value will be issued in other years. The photo-lithography will be executed by Mr. A. Brothers, of Manchester, who, some time ago, reproduced in a similar manner Whiteley's *Emblems*.

PHOTOGRAPHS OF THE ECLIPSE.—Mr. W. L. H. Skcen, of Colombo, Ceylon, has favoured us with ten photographs of the Eclipse on the 18th ult., taken with an ordinary 12 by 10 view lens, the exposure being instantaneous. The work is very excellent, and the gradual progress of the eclipse admirably shown; but the images are, of course, too small—about the size of a pea—for astronomical purposes.

COLLODIO-CHLORIDE PAPER.—A correspondent sends us a very charming 10 by 8 landscape on Obernetter's collodio-chloride paper. Nothing can exceed the delicacy and beauty of the definition rendered. He says: "I have been much interested in the notices, which have from time to time appeared in your journal, regarding the paper prepared by Herr Obernetter; and, being desirous to try it, I procured a supply, and have been experimenting with it, with great satisfaction to myself. I find it superior to any of the albuminized paper I have met with, in giving tone, brilliancy, and detail. I send you a print in which this paper is used, and would like your opinion of it. I must, however, call your attention to a rather curious defect, arising from a cause similar to one given in the PHOTOGRAPHIC NEWS some time ago. A broad pencil mark on the back of one of the sheets had come in contact with the prepared side of another, and though both were kept in the dark, the impression must have been conveyed from the one to the other, although invisible on the prepared side till the picture was developed, when it came out as you see. I may send some smaller prints, in 'Obernetter,' another time."

BEWARE OF THE COLTS.—A correspondent, J. D. W., sends us an account of "An Amateur's First Trip," and the mishaps attending it:—"Having selected a spot on the slope of a beautiful hill, the tyro, with an assistant, went at six a.m. and prepared for operation, having first planted his tent near a brook some 150 yards below. After adjusting the lens, the youth looked towards the locality where he had left his tent, which, to his surprise, had disappeared. Rushing back, he found, to his great mortification, his tent prostrated, his silver bath wasted, and his hopes of success on that occasion frustrated. When recovered from his consternation, the question arose, Who or what has done the mischief? The miscreants were near in the shape of two frisky colts, which had come to give the tent a Frenchman's salute, or to be reveuged on the invader of their territory. Many a hearty laugh has the young amateur and his friends had over his misfortune, and he has resolved never again to leave his tent before he had placed an armed sentinel to protect it."

A NEW CAUSE FOR VARIETIES IN THE QUALITY OF COLLODION.—A correspondent writes: "The other day the representative of a collodion maker, in soliciting an order, was eloquently showing the difficulties in the way of home brewing in regard to collodion, and enlarging on the varying nature of soluble cotton. The latter was to be attributed, in his opinion, to the different pastures on which the sheep producing the cotton wool were fed!"

COLLODION AND TOOTHACHES.—The *Lancet* says:—"Toothache can be cured by the following preparation of carbolie acid: To one drachm of collodion add two drachms of Calvert's carbolie acid. A gelatinous mass is precipitated, a small portion of which, inserted in the cavity of an aching tooth, invariably gives immediate relief."

BALLOON PHOTOGRAPHY.—A contemporary says:—"M. Toumachon, the photographer, recently performed a feat worth recording. Having ascended to the height of nearly a thousand feet in the captive balloon at the Hippodrome, Paris, he succeeded in taking several photographic views, accurately representing the city from a birdseye view. The chief difficulty he encountered was the rotary motion of the balloon. His success shows the practicability of obtaining correct representations of the positions of military forces safely and rapidly." It should not be forgotten that Mr. Black, of Boston, some years ago successfully performed a similar undertaking.

To Correspondents.

YORK.—There is a little unnecessary complication in the formula you have been using; but the excessive bleaching is chiefly due to using, too soon after it was made, a very strong bath. Time and dilution will improve it; or you may use it at once if you dilute it with an equal bulk of hot water. Try an ounce of the solution; add to it an ounce of very hot water, and, when quite cold, try it for toning. The probability is that it will work quite satisfactorily.

J. B.—The passage you enclose is an amusing illustration of the mode in which outside journals speak of photography. It should

be borne in mind, however, that instantaneous exposures depend quite as much upon the light as upon the subject, and upon the lens as upon the process. We have ourselves produced instantaneous marine subjects on Dr. Hill Norris's rapid dry plates, and we have seen Mr. R. Manners Gordon take groups of cattle in two seconds with his gum plates.

M. B. B.—The object of the preliminary coating of india-rubber in the patent albuminized paper was to partially render the paper waterproof and non-absorbent, and so to keep the albumen on the surface. When that office is served, it becomes of little comparative consequence whether the india-rubber changes afterwards or not, if its first purpose has been subserved. We have heard good accounts of it, but cannot speak of its advantages from experience.

W. M. S.—The Kinnear camera is an excellent, light, and convenient camera for field work. The lenses you name can with convenience be used with this camera. We cannot with propriety recommend any special lens by name here, but if you will make a list of those from which you wish to select, and attach to each one a number, we can then indicate, by its number, that which we think will suit your purpose best.

W. J. A. G.—We believe it is intended to open the next session of the Photographic Society with an exhibition of pictures in the rooms at Conduit Street, as on the last occasion. It will be opened on the evening of the second Tuesday in November. 2. We have not yet had any personal experience with Harnecker's dry collodion, but have heard various good accounts of it. 3. In preparing dry plates in cases where a long immersion in the nitrate bath is necessary, bear in mind that it is not all waste time, as, whilst one plate is in the bath others can be washed, coated with the preservative, &c.; and, if necessary, two baths may be kept going. Precision and perseverance are the only aids to success in dry-plate working which we can recommend.

C. A. C.—To proceed against any one who has infringed the copyright of one of your pictures, it is necessary to apply for a summons to a magistrate. When the case comes to hearing you must be prepared to prove satisfactorily that the copyright is yours, and that all the steps necessary to secure it to you, laid down in the statute, have been carried out; and next, that the person charged has infringed your copyright. It is wise, in such a case, to employ a respectable attorney to conduct the business for you. He will tell you if you have not a good case, and save you the trouble and expense of going further; and if you have a good case and succeed, his expenses will probably be allowed by the Court.

NORTH LIGHT.—Your letter is scarcely so clear as it should be, to enable us to give you efficient advice in such a case. You speak of the "lighted end" of your room, but your description refers to a lighted side, which, of course, would be the right thing, as the end should not be lighted. In the studio of the gentleman you mention, it is possible to take both sides of the face, but it is more convenient and effective for one side than the other. The proportions you describe for your intended studio are good, and if you can build it so as to allow the 12 feet by 9 feet of side-light to face the north, the result will be good. You need not then have any glass but that in the side and skylight on the north side; you can then use either end of the room, and so get a perfect light on either side of the face.

J. CARTER BROWNE.—When an old dry-plate photographer meets with difficulties like those you describe, which he cannot overcome, the case is serious, and we are by no means certain that we can name a remedy. Our own experience with the process you name is small; but if you have not found blistering inherent in the process, it must be due to preventable causes. The use of a thick tough collodion would conduce to the end. The use of ground glass for the transparencies would undoubtedly conduce to it, for two reasons: one, the difficulty of getting a perfectly clean ground surface, and the other the fact that the film rests rather on a series of points than on a continuous surface, a condition which would conduce to the formation of blisters. The use of nitric acid for cleaning the glasses would, if any trace of it remained, undoubtedly tend to the formation of blisters. In the little experience we have had with gum and tannin as a preservative, we found the formation of blisters a serious trouble, which was somewhat modified by the use of alcohol and water to moisten the plate before development. 2. Mr. Smith, of Negretti and Zambra's, is the inventor of a printing frame for transparencies, rendering transposition unnecessary. It can be had at the establishment in Fleet Street; the price we do not remember. 3. The difference in the results to which you refer is most probably due to the difference in the collodion. Let us hear further from you as to whether you get rid of the blistering.

PETER SIMPLE.—The heat of an ordinary oven would not be sufficient to burn in a picture on porcelain. It might be possible with some ingenuity to manage with a kitchen fire. The absence of detailed information as to the nature of a muffle arises from the fact that it is presumed that few will undertake such a process as

enamelling without some previous knowledge of the technical details. The chief duty of photographic journals is to describe the photographic part of the business. We shall have pleasure, however, in aiding you in this part of the matter. A "muffle" or "muffle furnace" is practically an oven with arrangement for the fire to surround it perfectly, and so bring the interior to a white heat without contact with smoke or ashes, &c. For experimental purposes, you may construct a substitute. Take some fire-bricks, and arrange them in a large kitchen range so as to form a hollow chamber, the interior about the size of a brick; then, by means of a pair of bellows, get up a white heat. Now place a piece of fire-brick about an inch thick inside, and on this place the enamel to be burnt, and close up the aperture for a few minutes, varying, according to the requirements of the materials used, from three to ten minutes. With a soft enamel a red heat may be sufficient. If you have had no experience in this art you must expect some failures; for, besides photographic difficulties, you must remember that the art of enamelling is a delicate and difficult as well as a beautiful operation, and sometimes requires the devotion of years to ensure the highest success. In your earliest attempts you must be content to produce your arms in a monochrome, and substitute a goose vert for a goose argent.

B. L.—Thanks for your well-meant remarks, but the matter is not worth further attention. We hold with Popo's lines in relation to the statements which have excited your indignation:—

"One half will never be believed,
The other half ne'er read."

II. W. P.—To get more equality of illumination in your enlargement, use either a lens of longer focus, or stop down that you now use. 2. For lining a cistern for collecting rain water for photographic purposes you may use either lead, or zinc, or gutta-percha without much hesitation; the latter is, however, the safest. 3. We fear that any society combination for the purpose of maintaining prices would be difficult to organize and carry out; but something analogous is at the present time being attempted in America, the result of which we watch with interest. We strongly deplore at all times the competition of cheapness, and recommend that of excellence as something far better. As a rule, they who initiate a competition in lowness of price are conscious of their inability to succeed in a competition of excellence. 4. The only means of overcoming the difficulties of colour in photography consists in full exposure, the free use of bromides, and the exercise of judgment and taste.

SILEX.—We have no reason to suppose that gelatine forms a combination with silver, insoluble in hyposulphite solution, like the combination of albumen and silver, and plain paper prints (in which the sizing material is gelatine) do not usually show any trace of silver in the whites, except the paper be kept a long time between exciting and fixing. In the latter case a decomposition at times occurs, which leaves in the body of the paper a compound not easily removed in the fixing bath. Mr. Rouch is now at home, and doubtless can attend to your proposal.

O. G. MASON (New York).—We send the back numbers you require. 2. The cyan process is making steady progress in this country, and thousands of prints have already been produced by it. We have just received some dozens of very fine results from one of our most enterprising professional photographers, who is going into it extensively. So far as we can judge at present, there will be no difficulty or uncertainty wherever the thing is gone into in earnest; but on a small scale it will be more trouble than silver printing. In our experimental operations we have found no uncertainty or difficulty of any kind not easily overcome. 3. We have not received any copies of the moon photograph to which you refer. We shall have pleasure in receiving the prints you kindly offer, and to forward copies to our societies. Thanks for the communication, which shall appear in our next.

W. T. BOVEY and J. MARTIN received.

Several Correspondents in our next.

Photographs Registered.

- Mr. J. NORRIS**, Norwood,
Photograph of "Hammel."
- Messrs. T. and J. HOLROYD**, Harrogate,
Six Photographs of Rev. J. M. Bellow.
- Mr. D. PHILLIPS**, Aberdare,
Three Photographs of H. Richards, Esq.
- Messrs. A. and G. TAYLOR**, Cannon Street, London,
Seven Photographs of H.R.H. Princess of Wales.
- Messrs. T. and C. LADMORE**, Hereford,
Two Photographs of R. Baggally, Esq.
Photograph of G. Arbuthnot, Esq.
- Mr. H. J. TAPHOUSE**, Barrow-in-Furness,
Three Photographs of Lord Hartington.

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CONTENTS.

	PAGE
The Stability of Negatives Intensified with Iodide of Mercury	481
Medals at the Cornwall Polytechnic Exhibition	482
Oval Masks for Portraits	482
Carbon Reproductions	483
Diffusion of Fœus. By the Hon. John W. Strutt	483
Photographs of the Royal Cornwall Polytechnic Exhibition	485
Pictorial Effect in Photography. By H. P. Robinson	486
For Removing the Varnish and Collodion Film from Old Negatives. By O. G. Mason	487
Short Essays on Photography and Art. By "Respiec Finem"	487

	PAGE
On the Employment of Collodionized Paper. By Ludwig Schrank	488
A New Method of Etching Photographs upon Glass. By Dr. Liesegang	489
Correspondence—Distortion and Perspective—Wet Photography in the Field—Panoramic Camera—South Light—Wet Collodion without Water	489
Talk in the Studio	491
To Correspondents	492

THE STABILITY OF NEGATIVES INTENSIFIED WITH IODIDE OF MERCURY.

THERE are few modes of intensifying more simple and certain, none which produce more perfect results, than that in which printing vigour is secured by the precipitation on the negative of a layer of iodide of mercury. At one time this method was a great favourite amongst many able photographers. The card negatives of Mr. Lacy—a name almost forgotten now, but once a name of mark—were all intensified by this means, and few finer have been produced. Such negatives, however, possessed one fatal drawback: they were liable to change. The deposit acquired in the process of intensifying was sensitive to light, and in the process of printing the negatives gradually became more and more dense, until, finally, they became so black and hard that it was almost impossible to print through them, and the prints obtained were flat, coarse, and worthless. Negatives which, on their first production, gave delicate, soft, harmonious prints in fifteen minutes, eventually failed to yield anything presentable in as many hours.

At a time when prints were ordered in single copies, such a defect in a negative was rarely noticed, as it had no opportunity of being developed, and if it were known to exist, the fact would have been regarded with little apprehension. Even when the card mania began to set in, and prints were ordered by a dozen at the time, the defect was not at first appreciable; but when such orders began to be repeated from the same negative, and, still more, when, for publication, hundreds and thousands were required, this fatal defect was quickly detected, and felt to be intolerable, and the process was generally abandoned.

A puzzling circumstance remained, however: whilst the instability described was the common experience, there were exceptions. Some photographers declared that they never found any alteration in such negatives. In our own experience some changed, and some did not. The uncertainty was, however, sufficient to render the process untrustworthy, and unless the causes of instability and of permanence could be traced, and the conditions clearly laid down, few persons familiar with the possibilities would voluntarily risk the gradual deterioration of a negative of any value by submitting it to the treatment in question.

We have recently been led by observation and experiment to arrive at certain conclusions on the subject which tend to its elucidation. We have been induced to examine anew the conditions under which the negatives which have remained stable in our own hands were produced, and we have had opportunity of ascertaining the *modus operandi* employed by some photographers who, having habitually used iodide of mercury for intensifying, have experienced no change or instability in the results. The better to explain the causes in operation which lead to instability,

we will first briefly describe the common mode of applying the process.

A negative developed with iron in the usual manner was fixed and washed. At this stage it should be clean, and with the usual amount of vigour which an iron negative, produced in the usual way, without any attempt to intensify it, would possess. In some instances it was now dried, some photographers preferring the effect of intensification upon a negative which had been dried. The late Mr. Lacy, for instance, had a profound belief in the advantage of drying. His argument was, that if the intensification were conducted upon the film when it was in the soft spongy state in which it was first produced, there was generally some lateral deposit which marred the delicacy of the finest lines; but that when the film had been once perfectly desiccated, it never acquired the spongy, absorbent condition it had at first; and that the deposit the image acquired in the process of intensifying would be more strictly vertical, increasing the density of the image without making fine lines thicker or coarser. But whether the negative were dried or not, it was not intensified until after fixing. It was then treated with a weak solution of bichloride of mercury, say of five grains to the ounce. This was applied until an even grey tint was obtained, care being taken to avoid the white stage which the complete action of the mercury solution would cause. Having reached the grey stage, the plate was rinsed, and a one or two-grain solution of iodide of potassium was applied. By means of this solution the exact degree of intensity to be secured could be considerably governed. A slight application produced a greenish grey tint; a further application produced greater intensity and a more non-actinic colour, the image acquiring an olive tint, continued action producing a dingy yellow or citrine tint. The half-tones acquired value exactly in due relation to the high lights, and the negatives, when properly managed, were at once delicate, harmonious, and brilliant. If they had not changed, nothing could have been better.

To gain an idea of the cause of the change, let us examine the action of bichloride of mercury alone on the silver image. If a collodion picture, negative or positive, be treated with a solution of bichloride of mercury until it is partially whitened, then rinsed, and exposed to the light, it will rapidly darken. A portion of the silver forming the picture has been changed into chloride of silver, and a deposit of subchloride of mercury has been precipitated on the image. The chloride of silver formed is clearly sensitive to light, and becomes darkened when submitted to its action. But if, instead of stopping the action of the bichloride solution when the whitening process is only partially effected, it be continued until an opaque dead white image is produced, the whole of the silver image being converted into chloride, and a thick layer of subchloride of mercury deposited on it, light will be found to have no action upon it. We have

some examples in our possession which have been exposed to light for years without any diminution of the pure white tint they possess. The only explanation of this we can offer is, that chloride of silver—or, at least, dry chloride of silver—is not sensitive to light when in the presence of excess of chlorine or of a chloride.

It will be seen, then, that the negative, intensified with iodide of mercury in the mode described, is in the condition for change to which we have referred. A portion of the image is converted into chloride of silver, and left in a state in which it will readily darken by the action of light. The layer of subchloride of mercury deposited is converted into subiodide of mercury; whether it is changed at all by the action of light we cannot with certainty say, but an impression prevails that it is. If the action of the iodide solution were continued, it is probable that a portion of iodide of silver would be formed, and thus another element of instability be provided.

There are two or three modes in which, from a consideration of these facts, we might arrive at probable immunity from liability to change in negatives intensified by the method in question; and it so happens that the methods from which we should have anticipated stability are in practice found to give perfectly the required results.

The first method consists in continuing the action of bichloride solution until the image is perfectly whitened, and the insensitive stage of which we have spoken is attained. If a solution of iodide of potassium in any degree too strong (say one of even six grains to the ounce) be applied, or even if a weak solution be applied too long, a bright yellow layer of proto-iodide of mercury is obtained, and these yellow negatives, although at times very good, are apt to give flat, hard, unsatisfactory prints. But if a weak solution of iodide of potassium, not exceeding one or two grains to the ounce, be employed, and used with care, the greenish grey negative, characteristic of subiodide of mercury, is obtained, and this generally secures the fine printing qualities of negatives produced by the first method described.

Another method, which we find, from the experience of others, yields negatives which do not change, and which, in the brief verification we have had opportunity of making, seems to give stability, consists in the use of a solution of iodide of mercury direct. Iodide of mercury is soluble in a solution of bichloride of mercury, or in a solution of iodide of potassium. The simplest mode of making the preparation is to make a five-grain solution of bichloride of mercury, and a five-grain solution of iodide of potassium, and mix them together in equal parts, or, rather, at the rate of an ounce and a quarter of the latter to an ounce of the former. A red precipitate will be formed, which will redissolve on gradually adding more to the iodide solution. The resulting mixture will intensify vigorously, giving a greenish grey or an olive tint to the negative, which, as those who have tried it for years assure us, undergoes no change by the action of light.

MEDALS AT THE CORNWALL POLYTECHNIC EXHIBITION.

THE Royal Cornwall Polytechnic Society, which possesses especial interest to photographers as being the only body which has an annual exhibition of illustrations of the arts and sciences generally, which gives to photography a prominent position, and awards medals for especial excellence in the contributions, has just issued its report, an extract from which, so far as it will be interesting to our readers as relating to photography, we subjoin. It says:—

"In the collection of photographs this year the judges were particularly struck with the amount of uniform excellence exhibited, thus leaving less room for great contrast between the productions of different artists than they have sometimes noticed, and rendering selection between them often exceedingly difficult. Prominent amongst the landscapes stand the four beautiful pictures by Nelson Cherrill,

in which the clouds and the aerial perspective are rendered with a truth seldom seen. To these the judges award a first silver medal. The first bronze medal they give to George Wardley, Manchester, for views in the English lake district; also, a first bronze medal to W. H. Warner, Ross; and a second bronze medal to R. P. Yeo, Plymouth, for views and interiors. These, though of small size, exhibit great delicacy and skill. In the amateur class a fine series of views taken on dry plates by J. Beasley, London, show great artistic taste and manipulative talent, comparing favourably with the best of wet plate productions, and the judges awarded to him a first class bronze medal. The second bronze medal they gave to T. M. Brownrigg, Dublin, and a prize of £1 to J. H. Morgan, Clifton. Coming to portraiture, the judges found great difficulty, where all was excellent, in arriving at a decision. After a long comparison, they determined to award a second silver medal each to R. Faulkner, Torquay, and Briggs, Leamington; to the former for some beautifully posed and delicately soft portraits printed by Swan's carbon process, and to the latter for a finely-modelled portrait of a gentleman, and cabinet portraits, with natural background. They also award to R. Slingsby a first bronze medal, for the portrait of a lady and a fine little life study, "Rest." To R. F. Barnes, London, they gave a second bronze medal, for photographs burnt in on enamel. For three capital enlargements made on albuminized paper by direct printing in the solar camera, a first bronze medal is awarded to J. F. Trull, Falmouth."

There are two or three facts of interest in connection with these awards which are worth mentioning. The first prize, it will be noticed, is awarded to our esteemed contributor, Mr. Nelson K. Cherrill, for landscapes with clouds, the finest of these being "Rusthall Common," which was selected a few months ago by the Committee of the North London Society as a presentation print, the selection of the Committee and the judges thus singularly corroborating the correctness of each others' taste. As this picture is now in course of distribution, it may be worth while to mention that it illustrates the possibility of obtaining very perfect results in the field by means of the wet process without water, the golden syrup solution which we recently described having been used by Mr. Cherrill, who, with Mr. Robinson (his partner), has largely applied it during the past summer.

Another point worth noting is the fact that in the landscape department, with a limited list of prizes, medals are obtained by pictures illustrating at least four different processes. Mr. Cherrill's work is by the wet process; Mr. Wardley's by the collodio-albumen; Mr. Beasley's by the Fothergill process; and Mr. Morgan's, as he recently informed us, by the coffee process. Mr. Brownrigg, if we remember aright, uses the Fothergill process. Mr. Warner and the other medallists all use, we believe, the wet process.

Mr. Barnes, who receives a medal for enamel portraits, has been quietly working for many years in this direction, working out processes of his own. Some years ago we examined many of his experimental works, which were interesting, and had much promise. From the fact that he has here obtained a medal, we infer that he has made great progress, having, in this instance, had to compete with the enamels of Mr. Henderson, some of which we have recently seen, and which are admirably perfect.

OVAL MASKS FOR PORTRAITS.

WHERE the best effect in a portrait—especially if it be small—is secured by cutting the picture of an oval form, it is much more convenient and effective, as most photographers know, to mask the negative so as to print it through an oval aperture of such shape and size as may be most suitable. It has been a moot point amongst photographers, as to whether black paper, yellow paper, excited albuminized paper blackened by light, or tinfoil, formed the most convenient and useful masks, and the various suggestions and discussions on the subject, as well as the queries

which reach us from time to time, sufficiently attest that a very large number of photographers undertake the somewhat troublesome task of making such masks for themselves. It is by no means an easy task to cut the oval apertures true and clean, and we have not unfrequently seen the effect of a very good picture spoiled by the irregular edge or imperfect shape of the mask with which it had been printed.

Until very recently, we were not aware that such masks, of different sizes and shapes, very perfectly cut, could be obtained ready for use, and we doubt not that a large number of our readers are in a similar state of ignorance, from which they will be glad to be relieved. Whilst in Mr. Burgess's studio, we noticed that he used some excellently made masks in contact with the negative in producing his burnum prints, all of which are thus printed through oval masks. We learnt that the masks were supplied by Mr. Mander, of Birmingham, who, in reply to our enquiries, informs us that he makes them of all sizes. We have examples before us of nearly a dozen different sizes of oval apertures for card pictures, ranging from one inch to upwards of three inches in the longest diameter. The apertures are cleanly cut by means of punches, the material being glazed black paper, quite opaque. Nothing can be better for the purpose, and nothing more convenient. We presume that they can be obtained through dealers generally.

CARBON REPRODUCTIONS.

WE have recently been favoured by Mr. Sarony, of Scarborough, with some very admirable examples of the value of Mr. Swan's carbon process for reproducing works of art. Whatever tardiness may be manifest in its introduction to portraiture or landscape work, there is little doubt that carbon must soon supersede silver for photographic reproductions. The possible instability of silver prints has always been used as a strong argument against the use of photography as a means of popularizing art, by many really anxious to diffuse good examples of the great works. The introduction of the carbon process, and the especial facility with which it lends itself to the faithful reproduction, in various tints, of monochrome, of all kinds of pictures, has been gladly recognised and applied, and will doubtless shortly give a completely new impetus to art education.

The pictures we have just received from Mr. Sarony illustrate in a special manner the value of the carbon process, reproducing not only the drawing, but the colour of the original in the very material employed by the master. The subjects consist of a series of masterly sketches by the well-known marine painter, Carmichael, who recently died. The original sketches are in sepia, and the photographic copies are in sepia, so perfect in their rendering of every touch and tint, that in many instances an expert might be puzzled to distinguish the drawing from the photograph.

The boldness, freedom, and spirit of Carmichael's sketches give them great value both to the art student and the collector. Fine in composition, firm and accurate in drawing, they seize with rare truth and beauty the fleeting phases of the landscape which struck his fancy. They comprise a good selection of sea pieces, and some fine landscapes, the majority being about 15 inches by 10 inches in size. The reproduction is admirably done. The negatives are evidently very perfect, and nothing can exceed the excellence of the carbon printing. Mr. Sarony is extending his arrangements for carbon printing, having ordered a larger engine with a view—having tested the process—to carry out the arrangements on a very complete and extensive scale. Hitherto, notwithstanding that much good carbon work has already been done in this country, the process has received its largest development in France by M. Braun, of Dornach. We hope shortly to see, in the hands of the Autotype Company and their licensees, the carbon process, which has been developed and perfected in this country, carried out with a degree of enterprise equal at least to that which M. Braun has with so much success devoted to it.

DIFFUSION OF FOCUS.

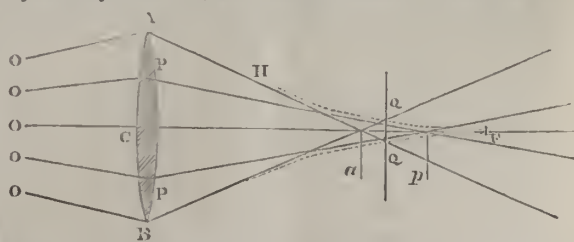
BY THE HON. JOHN W. STRUTT.

IN a review of a work by Dr. Monckhoven in a late number of the PHOTOGRAPHIC NEWS, a passage is quoted on the subject of what is called diffusion of focus. I have not seen the work itself, but I think an erroneous impression is likely to have been produced on the minds of those who read the extract. Some time ago, when the subject first began to attract the serious attention of photographers, there were many discussions in the journals, and it was generally admitted that true depth of focus was to be attributed to spherical aberration; but very little was said on the manner in which spherical aberration produces this result. As the matter is an important one, and not very easy to those who have not made optics a special study, I have thought that a few remarks on it might be acceptable to photographers.

In most applications of optics to the formation of images the point of greatest importance is, that the definition should be the best possible at the centre. Thus, in a telescope, that object-glass (aperture and focal length being given) is the best which most accurately collects to a point the rays from the star or small portion of the sun's or moon's surface. The distinctness of the image off the axis, its curvature, or distortion, are matters of comparatively little importance. The spherical aberration, then, of a telescopic object-glass must be reduced to its smallest possible amount. In a certain sense this result might always, in any object-glass, be attained by limiting the aperture, but it would be at the sacrifice of light, and the increased effect of diffraction would in many cases more than counterbalance any advantage arising from the reduction of spherical aberration. The real problem is to effect this reduction with a given aperture.

When photography was first introduced, and the attention of opticians was turned to the construction of photographic lenses, it was natural that too much should have been thought of the importance of securing freedom from spherical aberration; but soon the necessity of a flat field and absence of distortion appeared, and to secure these a certain sacrifice of definition was essential, though far more remained than was necessary in an image not required to stand the test of magnifying. Another point of difference between the requirements of photography and astronomy was also obvious. A photographic object-glass has to form images of objects comparatively near and at different distances, and that not only at different times, but frequently at one and the same time. Now if the lens collects accurately to a point on the ground-glass or plate the rays from an object at one distance from it, it is clear that the rays proceeding from an object at a different distance, tending, as they do, to meet at a point before or behind the plate, will actually meet the plate in a circle of small diameter; and it is important to notice that this circle will be equally lighted; that is, the rays will be uniformly distributed over its area.

If, then, it be required to photograph on the same plate objects (say A and B) at different distances from the lens,



supposed to be free from spherical aberration, there are notably three distinct ways in which the adjustment for focus may be made. First, it may be made so that the light from A is accurately collected to a point on the plate, in which case A is perfectly defined, but B, being represented by the above mentioned small circle, is badly defined in proportion to its diameter. Secondly, the adjustment may

be made for B as in the first case for A. One of these arrangements would, of course, be adopted when the definition of one of the points is required to be the best possible, while that of the other is of comparatively no moment. Such occasions arise, but in pictorial photography it would be generally desirable that both objects should be fairly represented, and that the definition of one should not be entirely sacrificed in order to improve the other. In such a case the focussing would not be made on either A or B, but on a point (approximately) half way between them, so that neither A nor B would be perfectly defined, but would be represented on the plate by circles of light equal to each other, but of only half the magnitude of that which represented one point in the first and second cases. This readily suggests the question, would not a lens affected by spherical aberration be capable of giving as good a representation as this of A and B on the screen? It is true that in actual photography there would be generally some third object, and so situated that the peculiar power of the lens would be brought out in perfectly defining it; but this would be rather a drawback than an advantage, as a tolerably uniform definition is usually desirable. We are thus naturally led to enquire what effect the introduction of spherical aberration would have on the definition of objects situated at various distances from the lens. With this end in view it is necessary to examine carefully the nature of the bundle of rays which proceed from towards the screen after refraction by an uncorrected lens.

In the first place it is to be noticed that the rays which are refracted by one part of the lens do not, in general, reach the axis at the same point with those which come from a different part; so that if we divide the lens into rings, proceeding from the centre outwards, each small ring may be supposed to act as a perfect lens; but there is a variation of focal length in passing from one ring to another. Thus the focal length of the outermost ring C A, and that of the central part C F, the intermediate rings having intermediate focal lengths. The least section of the assemblage of rays is at Q, where the curve F Q H, touched by all the rays, and called in optics the caustic, meets those from the edge of the lens, which, having cut the axis in A, again diverge. But it does not follow, as might at first be supposed, that the screen should be placed there in order to get the best possible definition of the object O. The reason of this will appear presently.

Between the lens and Q the space occupied by the rays is bounded by the curved caustic surface, but beyond Q by the cone, whose vertex is at A, formed by the above, refined to extreme rays.

A second radiant point, O' nearer the lens (say) will produce an approximately similar system of rays to the above, only displaced somewhat towards the right, or from the lens. But instead of considering the two systems of rays as cut by a fixed screen, as in actual practice, it is allowable and more convenient for explanation to confine ourselves to one system, and conceive that intersected by parallel planes at varying positions along the axis. This substitution proceeds on the assumption that the objects are not at very different distances from the lens in relation to its focal length.

In order to avoid continual reference to them, it will be supposed in what follows that the *aperture* and *focal length* of the lens are given, or do not vary under the circumstances contemplated, which of course does not prevent the aberration changing its amount within certain limits. The distances between the two cutting planes which we have to consider is given as soon as the positions of O O' are fixed. And as, in the case of a corrected lens, the definition of objects slightly out of focus may be measured by the diameter of the small circle which represents a point, the question is suggested, where must the sections in the present instance be taken to make their diameters equal? In Conington's Optics there is a remark to the effect that such a quality as definition cannot have a measure. Thus I

suppose one definition could not be said to be twice as good as another. But neither could the same be said of two temperatures, at least, prior to modern discoveries, which does not prevent the ordinary thermometer from being a very useful measure of temperature.

The planes will evidently lie on opposite sides of Q, but not equally distant from it, inasmuch as the obliquity of the caustic surface to the axis on the left is less than that of the cone which bounds the section on the right of Q. A definite result can of course be obtained by the application of mathematics, and it will, I believe, be found that the magnitude of the aberration may be so chosen as to make the diameters of the section smaller than it is for a corrected lens; so that it would appear that for the *equal* definition of O O' a corrected lens is *not* the best. On referring to the original calculation I find that this statement is not quite correct. As the aberration increases from zero up to a certain point, the definition (as measured by the size of the section) would remain unaltered, and after that point would deteriorate. The correction in view of what follows is of no moment.

About a year ago I went through the calculation alluded to, but I was aware that it would give no adequate idea of the advantage of an uncorrected lens, on account of the fundamental assumption on which it proceeds, namely, that the diameter of the section of the pencil made by the screen may be taken as a measure of the distinctness, or rather indistinctness, of the image.

This, though admissible enough for a corrected lens, is by no means equally so when there is a spherical aberration, for then the light is not impartially distributed over the area of the section, nor according to any other fixed law, the same for all sections. There is, in fact, a series of points where the illumination is *much* (according to the ordinary theory of rays, infinitely) greater than it is elsewhere, such points being situated on the caustic surface, and also in a line along the axis between A and F. That this is so will be admitted when it is remembered that *all* the rays pass through the line A. The result is that a section taken between H and A has a bright rim, but nothing peculiar about the illumination at the centre. On passing A, however, while the bright circumference continues, a spot of intense light makes its appearance at the centre, and this state of things remains until Q is past. At this point the bright circle leaves the boundary of the illuminated area, continuing to contract, while the latter begins to expand. Soon after passing F the illumination becomes comparatively uniform over the whole area of the section.

All this may be easily observed by admitting the sun's rays into a darkened room through a hole in the shutter in which is fixed a lens of short focus. If the rays diverging from the small image of the sun thus formed be allowed to fall on a lens which possesses a considerable amount of spherical aberration (such as a microscopic or magic lantern condenser), the circumstances of the preceding paragraph are sensibly realized, and the construction of the refracted pencil can be examined by receiving it on a movable paper screen.

A very beautiful modification of this experiment has been made by Professor Stokes, who avails himself of the power possessed by certain substances of rendering visible and dispersing the blue and ultra-blue rays of the spectrum, a phenomenon to which he gave the name of fluorescence. The sun's rays, reflected horizontally, by a mirror placed outside the window, are admitted into the darkened room through a blue glass, and, after refraction by the lens, pass into a glass trough filled with a weak solution of osculine placed close behind it. The blue glass is not absolutely necessary, but much increases the brilliancy of the experiment. A solution sufficient for the purpose may be made by soaking a few chips of the inner bark of the horse-chestnut in a jug of water, but it soon decomposes. The path of the rays is marked by the luminosity of the liquid, somewhat as in a smoky atmosphere, and the bright line along the axis is

very evident. But if the light be limited to one plane by a slit placed in front of the lens, it disappears, as might be expected. The experiment may be varied by placing before the lens an opaque diaphragm, such as a piece of cardboard pierced with a number of small holes, by moving which about the composition of the pencil may be easily studied.

Inasmuch, then, as the light is so variably distributed over the section—sometimes concentrated on the circumference, sometimes at the centre, or both—the question arises, What is to be taken as the measure of the distinctness of the image? How far would a concentration of light towards the centre compensate for an increased diameter of the section? Although the answer is essential to a complete theory of the image formed by an uncorrected lens, I am not aware that it has ever been given. Possibly the nature of the original object would have to be taken into account. In the mean time, photographers will not hesitate. The choice practically lies between a flat-headed pencil with which no fine line or delicate tracing can be made (except over a limited portion of the picture), and the sharp central point of light, with the condition imposed that the ground must be gone over with a stump, softening, but not obliterating, the details. In fact, the image formed by an uncorrected lens, *properly used*, may be regarded as compounded of a multitude of images superposed on one another of all degrees of distinctness, the first roughly sketching the principal masses of light and shade, the intermediate ones giving all but the minute details, which are at length filled delicately in by the last perfect component image.

Some time ago it was proposed in the PHOTOGRAPHIC NEWS to submit the exposed plate for a short time to the action of weak diffused light, with a view of thereby giving additional softness, and of reducing the time of exposure in the camera. This method of procedure was not altogether unsuccessful in cases where, for some reason, it was impossible to allow the full time required for the formation of the invisible image. But it will be seen at once how far preferable it is to increase the aperture of the lens, *even though the rays from the added part be not in focus on the plate*, for instead of a uniform action fogging the shadows at the same time that it strengthens the lights and half-tones, we have, at the worst, the same uniform action over the lights of the picture, while the masses of deep shadows are spared.

I have confined myself entirely to the subject proposed, and have made no reference to chromatic aberration, although what has been said is in great measure applicable to it. When the question is examined with that object, it may possibly be found that the importance of perfect achromatism has been also exaggerated, although the difference in average refrangibility between the luminous and chemically-acting rays will always be an impediment to the employment of chromatic lenses. There would be very little difficulty if the lens were always used under the same conditions, as a *fixed* difference of position between the ground-glass and sensitive plate could be easily secured by a suitable arrangement of the plate-holder.

PHOTOGRAPHS OF THE ROYAL CORNWALL POLYTECHNIC EXHIBITION.

(FROM OUR OWN CORRESPONDENT.)

The thirty-sixth Annual Exhibition of the Royal Cornwall Polytechnic Exhibition, which has just closed, afforded the inhabitants of the west counties a sight of the finest, largest, and most varied collection of photographs that has ever been exhibited under the auspices of this valuable Society. The first number in the department was H. P. Robinson's. "Returning Home," representing a girl in humble life crossing a lonely heath on returning to her dwelling in the gloaming, after her day's labour at gleanings, is certainly the finest work of the kind we have seen, the timid, scared expression of the girl being forcibly portrayed, the landscape being excellent, and the whole composition of the

entire picture admirable. A likeness of Adam-Salomon stands pre-eminent among the portraits, not only from its fine manipulation as a photograph, but also the fine artistic treatment of pose and lighting, its general effect being that of an impression from a high class mezzotint engraving. The next exhibitor we notice is Briggs, of Leamington, who sends some pretty cabinet pictures, a frame of emolliotypes, and a fine 10 by 12 portrait, a good example of careful manipulation, somewhat marred by the roll of paper held in the hand. Four whole-lengths on 10 by 12 plates, by Clark, of Bristol, were most charming productions, the figures being bold and vigorous, and the accessories judiciously in keeping, sufficiently prominent without being obtrusive. Slingsby, of Lincoln, exhibited four portraits, and "Labour" and "Rest," two clever studies from the life. Stephen Thompson had four pictures—two English and two Swiss scenes. Much interest was manifested in two small frames of medallions, burnt in on enamel, by R. J. Barnes, of London; and also in another frame of enamel pictures, by Mr. Henderson. A frame of cabinet pictures taken in the studio, with backgrounds from outdoor scenes from nature, by Robinson and Thompson, of Liverpool, were very effective, and good examples of this class of combination picture. Some most excellent portraits, printed in carbon, as well as some studies, also printed in carbon, sent by Mr. A. Faulkner, so closely resembled prints from engraved plates, that a good many people could hardly believe they were in reality specimens of photographic art. This gentleman also exhibited some charming carte specimens of studies of children.

Of enlargements there were several exhibitors, the most noticeable of whom were J. F. Trull, of Falmonth, who showed three specimens, untouched—two busts, life size, and a half-length of a military officer—which would favourably compare with any others sent to any exhibition whatever. Of coloured enlargements, the only exhibitor was Mr. T. M. Douglas, of Edinburgh, whose name is appended to six pictures in the catalogue. Two of these pictures were really very fine specimens of art, being far superior in execution to what are generally shown as "photographic enlargements, coloured in oils," and might take fair rank among the higher class of portrait painting.

Of landscape, the most noticeable among the professionals were George Wardley, of Manchester, who exhibited some fine large examples of the lake and country scenery, and Nelson K. Cherrill, Tunbridge Wells, who sent half-a-dozen fine pictures, in one of which—"Rusthall Common"—the massing of the clouds was particularly grand. Of smaller subjects, W. H. Warner, of Ross, and R. P. Yeo, Plymouth, sent some very brilliant specimens of interiors, as well as out door scenes, on the cabinet size.

Mr. F. Beasley, jun., although in the amateur list, exhibited fifteen pictures 10 by 12, by the Fothergill process, which very few professionals could surpass. The value of this gentleman's contribution was enhanced by every picture stating the time between preparation and exposure, and exposure and development. Mr. J. H. Morgan, Clifton, another amateur, exhibited some remarkably good pictures, particularly one or two of Tenby Harbour. Some views and groups taken during the late campaign in Abyssinia, sent by Major Holland, R.E., gave the visitors to the exhibition some idea of Theodore's stronghold, and other points of interest in the late war in that country.

On Friday evening a conversazione was held, during a portion of which an account was given of Solomon's magnesium lamp, and its application to the purpose of enlarging from carte negatives. After the lecturer had minutely explained the properties of the lamp and the metal, and showed the audience enlarged images on the screen, he retired from the larger hall to the smaller one, and, after a comparatively short time, returned with an enlargement he had made in the interim, thus giving strong proof of the value of this invention to photographers. In the hall I perceived a worked-up enlargement, in monochrome, of Mr.

Solomon himself, as well as some other untouched pictures, and I should think many followers of the art who do not feel warranted in going to the expense of a solar camera will gladly avail themselves of this much less costly apparatus."

Another correspondent, after some remarks on the unusual excellence of this year's photographic exhibition, says:—

"There is a prospect of the Cornwall Society becoming migratory, and holding its meetings in other parts of the county; this will prove of much benefit to art in general, and photography in particular." He adds "a word in conclusion to photographers generally, and the Exeter local committee in particular. Next year the British Association hold their meeting in the ever faithful 'city of the red earth,' when a most excellent opportunity occurs for a great art display, graphic and photographic, to those interested in the proceedings of the exploration society. Further information may be obtained from Mr. A. L. Fox, one of the acting honorary secretaries of the Cornwall Polytechnic. For the British Association, Mr. H. S. Ellis, of Exeter, will furnish any particulars that may be required."

The official report of awards will be found in another column.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XXXVII.

MR. FRUWIRTH'S useful process of phototype, which not only reproduces engravings for the press, but also enlarges or reduces them, enables me to present one of the most perfect compositions of modern times, which, happily, belongs to the nation, and will remain an object of study as long as it exists.

Perhaps nothing in the whole range of art can be brought into comparison with the works of Mulready for technical perfection. In truth of drawing, elaborate finish, and exquisite colour, he excelled long before the works of the modern pre-Raphaelites made these qualities indispensable in pictures, and to these perfections he added most supreme skill in composition. His subjects were not always equal to his powers, and one cannot help regretting that he wasted such splendid art on themes such as "Boys firing a Cannon," "The Loan of a Bite," "Bob Cherry," and others; but even these incidents become, under his hand, elevated, and redeemed from the commonplace and vulgar. The nation is rich in possessing—through the



generosity of Mr. Vernon, and, more especially, of Mr. Sheepshanks—a large collection of his works, illustrating his progress from the commencement to the end of his career. Painted in his best period, "Choosing the Wedding Gown," of which an illustration is given in this chapter, is one of his finest creations, and is an admirable example for the student to have constantly before his eyes.

During the earlier chapters of this attempt to teach the

laws of art to photographers, when I had to deal chiefly with principles, and to enforce their use, I abstained as much as possible from giving long quotations from well-known works, well knowing that nothing tires a reader more than numerous extracts, often ill-adapted to the purpose for which they are intended; but in the later chapters, in which examples are introduced showing how these laws have been applied by others, I prefer, when possible, using the

criticisms of other writers, because they confirm, in a measure, the principles I have endeavoured to teach. For this reason I here introduce some remarks on the design and colouring of this picture from the *Art Journal*:—"As an example of Mulready's strictly domestic pictures, 'Choosing the Wedding Gown,' exhibited in 1846, is admirable; as a specimen of brilliant colouring it is superlatively excellent; nothing in modern art—it may be said in the art of any age in this class of subject—has surpassed, or even equalled it. This splendour is not reached by the free use of positive colour, but by the most subtle and delicate application of tints, both in the lights and shades, worked up from the lowest to the highest scale, and culminating in pure red, ultramarine, &c., and all presenting the most perfect harmony, because founded and carried through on well understood and immutable laws. Then look at the composition: mark the arrangement of the two principal figures; how easily and naturally they are placed, and how carefully both attitude and action have been studied to preserve a right balance, as well as to support the subject. The extended hand of the silk-merchant, for example, was a necessity to fill up a space which would otherwise have been vacant; it serves as a counterpoise to the uplifted hands of the lady, and, it marks the impressiveness with which the shopkeeper commends his goods. And, lastly, notice the beauty of the fair purchaser's face—the future Mrs. Primrose—and with what earnestness she examines the piece of rich stuff; the kindly solicitude of her affianced husband, the worthy doctor; and the persuasiveness of the bland and smiling mercer. In the background is his wife attending to a customer; the artist has bestowed no less pains on the good dame than on the other and more prominent persons in the composition. In fact, whether we look for colour, form, expression, or design, we see each and all exhibited in the most attractive, powerful, and recondite manner."

Beyond all this the student will see other and more strictly technical beauties, corresponding exactly with those I have pointed out in other examples; the prominence of the principal figure; the opposition of the highest light with the chief dark in the centre of the composition; the balance afforded by the mass of rich stuff on the stool and the dog—even the ring on the floor is not without its artistic value—the opposition and contrast given to the curved and undulating lines by the straight lines of the piece of stuff in the lady's hand, and in other places; and, lastly, the repetition of the main incident in the background.

The illustration is a reduced phototype, by Mr. Fruwirth, of a wood-cut in the *Art Journal*, whose valuable illustrated articles on "British Artists" afford examples admirably adapted to the use of the student in composition and chiaroscuro.

FOR REMOVING THE VARNISH AND COLLODION FILM FROM OLD NEGATIVES.

BY O. O. MASON.

STAND the plates on edge (faces not in contact), in a kettle or boiler of any convenient shape and size, taking care that the plates do not come in contact with the metal of the boiler (this is prevented by placing a cloth on the bottom and sides, or by a light wooden form or rack, suitable for the size of plate under treatment). The boiler is then filled with cold water, and placed over the fire, the temperature being gradually raised to the boiling point, at which it is maintained about thirty minutes (often less); the films will then drop off, or may be easily removed by a little friction with the hand or a piece of cloth. After removing the boiler from the fire, the plates should be allowed to cool gradually before removing from the water, or they may become brittle.

In no case should cold water be used to cool the contents of the boiler, as the plates would be most certainly broken in so doing. I have used this plan for several years, and find it better than any other method of removing films which I have tried.

Short Essays on Photography and Art.

No. 5.—ON ART TEACHING AND ART STUDY.

BY "RESPICE FINEM."

DURING the last few years the attention of photographers has been called in a very especial manner to the importance of art study. The technicalities belonging to the science and to the practice of photography have been gradually mastered. Lenses and processes have reached a high degree of comparative perfection. I do not wish to suggest that in regard to these we can speak of finality, or say that nothing remains to be desired, nothing to be achieved: I simply state, in relation to material appliances—chemicals, processes, and lenses—that facilities exist sufficient to enable the moderately intelligent practitioner to devote his chief attention to the development of the plastic power of his art, and the testing of its capacity as a means of securing pictorial effect. And, as was natural, this technical advancement achieved, attention has been directed to higher ends.

Exponents of the art capacity of photography have never been entirely wanting, even in the days when it was asked, in high quarters, "What photographers wanted with pictures?" Some of the earliest calotypists were accomplished artists. In the early days of collodion, men like Grundy and Lake Price, and, at a little later date, men like Rejlander and Robinson, in subject pictures; and men like Bedford, Mudd, and others, in landscape work, have grandly illustrated the fact, that lenses and chemicals were obedient agents in artistic hands. These and others have been silent but efficient art teachers. Some years ago arose another class of art teachers, louder, but less efficient, yet not without their uses. Their business, it seemed, was to denounce what was wrong, rather than to illustrate by practice what was right. Such a mission, although not a lofty one, had its uses. Jonah, when sent to denounce the sins of the Ninevites, was by no means an exemplar of righteousness; but his mission had its specific usefulness. And they who have unhesitatingly, or even captiously, pointed out the artistic shortcomings of photographers, and the soulless emptiness of the mass of photographs—whether they have spoken from without, or as claiming a position within the photographic circle—have performed some service in advancing the art. The fatal fault of these quasi-teachers, who deal in denunciation on the one hand, and in nebulous vagaries on the "awe inspiring mysteries" of art on the other, is, that they confound more frequently than they enlighten; and if they convince the youthful aspirant after art excellence that if he cannot sympathise with these vague inborn yearnings after indescribable mysteries which are supposed to characterise the true artist, his work is naught, he is apt to throw up the effort in sheer disgust or despair. And this is, I need hardly say, the worst frame of mind in which a man can indulge. That there is such a thing as natural capacity, inborn fitness for artistic culture, cannot be doubted, and this is doubtless a necessary qualification for the highest success. But I think that ability to appreciate pictorial excellence, and the desire to acquire the power to realize it, are *prima facie* evidence of some fitness for the work, and I would earnestly impress the idea that with these pre-requisites, and capacity for careful study and honest labour, a fair mead of success is attainable by all students. I have always grieved, therefore, over the denunciatory style of art teaching which at one time prevailed, as little calculated to raise the status of photographers. There is great force in the lines in Bailey's "Festus":—

"Men might be better if we better deemed
Of them. The worst way to improve the world
Is to condemn it. Men may overget
Delusion—not despair."

In speaking of art teachers, it would be impossible to overlook the recent series of lessons in your pages by Mr. Robinson, so admirably clear, simple, full, terse, and practical; but it would be superfluous, as well as inadmissible, I presume,

for me to enter into either comment or eulogy thereon. I may remark, however, that they go far to negative a common apothegm, that very little of art can be taught. But there is another form of art teaching of which we have too little, and another class of art teachers of whom we have too few. I refer to those most valuable of all teachers who strive to produce by photography the highest results of which it is capable in pictorial art, not simply as a matter of business, not as a means of bread-winning, but from a love of the art, from a profound belief in its capabilities, and a resolve, at much cost and much labour, to demonstrate its fitness for rendering pictorial effect. For this, the highest reward they as a rule desire is, the appreciation and honour of their fellows; and this reward they do in the main receive. Such appreciation, I doubt not, in their estimation far outweighs the gibes of the envious and incapable which they must also receive. But putting this latter small class of small detractors aside, it has often struck me that there is too little active and demonstrative appreciation amongst photographers of this highest class of art teachers. I believe that the works they produce are rarely published or offered for sale; but where they have been so published, have photographers generally purchased them, and shown, by their eagerness to secure them, that they appreciated the work? Many of the photographs of the late Mr. Grundy were gems of real art, and, so far as monochrome can go, might have rivalled the works of Gerard Dow or Teniers. And yet I question if one photographer in a hundred ever saw a copy. If I wanted to purchase a copy now I should not know where to procure it, and the negatives are, I believe, scattered about and lost. When Rejlander exhibited his first great picture, the "Two Ways of Life," it was received with coldness by some, with condemnation by others, and with the enthusiastic admiration it deserved by scarcely any. Of the hundreds of photographic triumphs in the field of art, full of fine lessons, which he has since issued, how few have found their way into the portfolios of photographers! When the pictures of Adam-Salomon were introduced to attention—pictures which have unquestionably shown to photographers a new and higher phase of photographic portraiture than they had before dreamed of—many photographers vied with each other in striving to ascertain how little merit they possessed, and how much of the qualities which they could not deny was due to trick or adventitious aid. Robinson, it is true, has been more fortunate; such of his art studies as he has published have, I believe, sold largely, and honours have attended his works wherever they have been exhibited, at home and abroad; not less than a score of medals, if I am rightly informed, having been awarded to them within half as many years.

The form of art study I should especially like to recommend to photographers would extend this class of art teachers. I should like to see more photographers enter the list to produce purely pictorial photography, and demonstrate the capacity for art purposes of camera and chemicals. Lessons in art are now not wanting; so much of art—especially in its relation to photography—as can be taught is now accessible in your pages; but this will be of little value without frequent effort to apply it; and this effort can only be imperfectly attempted in the regular course of the business of portraiture. It is only in the attempt to produce subject pictures, with time at their disposal, with sitters or models under some control, and with discretion as to choice of draperies, accessories, backgrounds, &c., that the photographic art student can hope to develop his powers, and only by such exercise that he can fit himself for securing the highest excellence in the ordinary practice of his profession as a portraitist.

The imperfect appreciation of such work already alluded to may, it is true, be cited as affording but little encouragement to effort in this direction. This is an objection of little weight, and that for many reasons. The reward will be found in the effort itself, and in the skill, facility, and command over ordinary professional duties the portraitist will

acquire by indulging in such studies. The power and confidence gained will be worth much, even if the pictorial studies fall short of the highest art excellence. The art would undoubtedly be elevated by such effort, and many worthy pictures would doubtless be produced, illustrating in various ways the plasticity of photography. Dryden tells us, in one of his pregnant lines, that—

"They had crowns who but endeavoured well."

I fear that in photography the mere aim or intention to succeed would win no crown amongst photographers, because, as a rule, the endeavour could only be made manifest by its success; but of this I am satisfied, that if all photographers who love their art, and are interested in its advancement, would make effort now and then to illustrate its pictorial power in other modes than by the production of "pot-boilers," not only would they gain in skill as individuals, but the standard level of excellence in photographic portraiture would rapidly rise, and with that must come a simultaneous elevation of the general status of photography and photographers.

I should have liked to say more on some phases of art study; but in undertaking to write one of the "short" essays on photography and art, I find space only for a few desultory thoughts is available. Possibly on another occasion I may offer a few further suggestions on the subject.

ON THE EMPLOYMENT OF COLLODIONIZED PAPER.

BY LUDWIG SCHRANK.*

The Industrial Employment of Collodionized Paper.

WE should feel some embarrassment were anybody to ask us if we could guarantee the successful introduction of collodionized paper, and we therefore propose to place the reader in such a position that he may be able to form his own opinion on the subject. In the first place, the price of the prepared paper is notably higher than that of albuminized paper, for in the fabrication of the former it is necessary to take into calculation the amount of loss incurred by the evaporation of the ether, alcohol, &c. But at the same time it must be remembered that in sensitizing a quire of albuminized paper as much as two or three ounces of nitrate of silver is expended, and this, added to cost of superintendence and the amount to be allowed for waste and spoiled materials, forms an important item, which is seldom sufficiently considered by photographers. The collodion-chloride paper is almost half as sensitive again as albuminized paper, and is always ready for employment, whereas the other must be freshly prepared from time to time. Then the prints produced are much sharper than those on albuminized paper, or, as we heard a Berlin referee express himself, they possess "fabulous sharpness." Lastly, even if the price charged is somewhat high, in these days of competition, it would be well worth while securing superior advantages, even at a notably increased outlay.

The facility with which the collodion film may be removed from the paper renders the material remarkably suitable for making transfers, and in this capacity it is of so great a value to the photographer that no studio should be without it, more especially the studio of the enameller. The latter generally employs collodion positives, produced in the camera by means of an ordinary negative, for the powdering of the porcelain colours; but if these negatives have been designed for making positives on paper, they are too vigorous for the enamel process, and produce, therefore, very hard results; moreover, the half tones sometimes suffer from the great heat to which they are subjected in the burning process. We have now before us several positive pictures produced by means of collodionized paper, in which softness and vigour are blended to such a degree that no better result could possibly be wished for. That the collodionized paper is in every way well suited, not only to the production of

* Continued from p. 478.

enamel pictures, but also for stereoscopic slides upon glass, and for multiplying negatives, is very obvious.

With regard to multiplying negatives, Professor Freund communicates the following:—

"The negatives which I send you herewith have been produced by means of a glass positive.

"The methods I adopt for reproducing negatives by means of the transfer paper is as follows: A print must be obtained of sufficient depth and vigour upon the collodio-chloride paper, an operation taking some time when conducted in the shade; this is then washed and fixed in the ordinary way. Toning is in my opinion a superfluous operation, and the examples I send you were produced from untinted prints. For making the transfer I employ a varnish made from equal parts of gum elemi and Venetian turpentine, and of spirits of wine ten parts. A glass plate is first warmed, and then coated with the varnish in the same manner as a plate is covered with collodion, and the fixed and washed paper picture (negative) having been pressed between blotting-paper, and likewise faced with varnish by means of a brush, is then placed face downwards upon the plate, and pressed down by means of the hand. Warm water is afterwards poured over the print, and the paper is thus removed, while the collodion film remains attached to the glass. Instead of glass, the so-called *caoutchouc vitrifié* might no doubt be used with good advantage; at the same time, the operation is easily conducted with glass, and the few bubbles formed exert no prejudicial influence, and may be obviated altogether with a little skill."

It has been the custom to multiply negatives by means of tannin plates by first producing a positive, and from this a second negative; by this method it is, however, difficult to guess the exact amount of exposure required, and the defects of the development in the original are exaggerated in the first copy, and again in the second, so that the new negative is in a very great degree inferior to the original. All these unpleasantnesses are completely avoided by the employment of collodio-chloride paper, and the production of reverse pictures therewith; the printing may be carefully watched and controlled, and the gradation of tone improved by judicious covering up of the copying frame; and, moreover, what is of the last importance in producing negatives of old paintings, the retouching may be carried on, not only upon the negative for the purpose of correcting the shadows, but likewise upon the positive to bring about a modification of the lights.

A positive upon transfer paper is free from all inconveniences which might happen from the breaking or injuring of a glass negative, and by its means any number of negatives may at any time be produced.

For the above reasons we would recommend the adoption of collodio-chloride paper at any rate in those studios where valuable negatives are preserved. As manufacturers of the material, we may mention MM. Obernetter, of Munich; August Freund, of Tarnopol, Galicia; and Adolf Ost, of Vienna; and there is no doubt that the time is not far distant when all dealers in photographic materials will find it necessary to direct their attention to a product of so much importance.

A NEW METHOD OF ETCHING PHOTOGRAPHS UPON GLASS.

BY DR. LIESEGANG.*

A FEW months ago, one of my pupils, M. E. Siegwart, of Neuchatel, communicated to me a few suggestions relative to the process of etching photographs. With the method he suggested I have made several experiments, and these having convinced me that it is of some practical value, I now publish the details of the same.

Etching upon glass may be employed either for the purpose of producing a dull picture upon a transparent ground,

or a transparent picture upon a dull ground, the mode of manipulating most in vogue being to cover the glass surface with a coating of wax, and to etch the picture upon the same, or to paint the image upon the glass with a wax colour or varnish, and then to treat the naked glass with fluoric acid. The fluoric acid changes the silicate bases of the glass into soluble salts of fluorine wherever it comes into direct contact, but where the surface is protected with wax the acid has no effect; the latter is applied sometimes in the form of gas, and sometimes in a liquid state, but generally a mixture of fluor spar and dilute sulphuric acid is employed.

M. Siegwart proposes the following mode of proceeding:—

A solution of gelatine is prepared similar to that used in the Joubert or Obernetter dusting processes, and made sensitive to light by admixture with bichromate of potash; the surface of the glass upon which the picture is to be produced is then coated with this liquid, and exposed to the sun, either under a positive or a negative, according to whether the image, or the ground, is required to be dull. After exposure, the latent picture is sprinkled over with very finely powdered fluor spar, or, better still, with cryolite powder ($3 \text{ Na Fl, Al}^3 \text{ Fl}^3$), and then varnished with thin normal collodion, when it is ready for treatment with dilute sulphuric acid. The fluor spar attaches itself to those portions of the surface which have not been acted upon by the light, and, on the application of the acid, the process of etching extends likewise to these particles. As the half-tones received less light than the shadows, a proportionately less quantity of the powdered fluor spar adheres to these parts than is attached to the lights, and therefore the half-tones are less deeply acted upon by the etching fluid.

Another method of operating is to employ a gum resin of some kind; as, for instance, benzoin, copal, shellac, dammar, Botany Bay gum, asphalt (all of which melt at 100° Cent.), these being of course very finely powdered and sifted. The fine particles of gum are dusted over the glass surface, and the picture is then transferred thereto; the glass is now warmed to the degree required to melt the resin, so that the picture becomes secured to the glass, the coating of resin serving as a ground for the subsequent etching with fluoric acid. By this means half-tones may easily be obtained.

If, instead of a gum resin, a glass flux easily melted, or borate of lead, is used, and the glass with the picture is placed in a suitable furnace or oven, a cementation of the whole takes place, and by subsequent treatment with a strong acid an image of the most brilliant description may be obtained. Instead of dusting the finely powdered borate of lead upon the glass, it may be added to the gelatine mixture in the same manner as in the carbon process.

Very beautiful effects may be produced by this process, if, instead of using ordinary glass, a white glass is employed covered with tinted glass, so that a coloured picture may be produced upon a white ground. Or images of two colours even may be obtained by taking a compound glass (say, for instance, yellow glass covered with blue); the etching will then produce a yellow image upon a green ground. Many variations of this kind would naturally suggest themselves to the mind of the glass manufacturer.

Correspondence.

DISTORTION AND PERSPECTIVE.

SIR,—The subject of distortion and perspective, as brought forward and illustrated by Mr. Cherrill, is of so much interest, and promises, if worked out, to be of so much use to the photographic art in determining the relative value of long and short focussed lenses, that if you will allow me I will go a little more into the matter, trusting, at the same time, that it will be duly taken up by others.

To begin with, then. Like Mr. Cherrill's artist friend, I believe that all photographs are, and must be, if we speak strictly, wrong in perspective (I put aside distortion from curvature, &c.),

* *Photographisches Archiv.*

but that one may, by artifice, reduce the exaggerations within narrow limits, and so produce pleasing results. I use the term exaggerations, for I think it can be proved to be such, having its advantages and disadvantages, and being a friend or an enemy according to the way we treat it. Let us look at some of the phenomena. Take Mr. Cherrill's mirror test, and here I think a little consideration will show that gentleman that he is reasoning on a fallacy in believing that in your reflection in the mirror you are looking on a true perspective, or such as you would see in a real object. Thus, if you stand at a distance of twelve feet in front of a mirror, you see yourself as a spectator would see you who was twenty-four feet from you, or just as much behind the mirror as you are in front of it; if now you stretch your hand horizontally towards the mirror (call it three feet in advance of you), your hand will look to you enlarged, and well it may do so, for though it ought to appear as it would to a spectator at a distance of twenty-one feet, it will really look to you as if you had pushed it forward a distance of six feet; in fact, as if it was seen with the perspective enlargement of an object which was eighteen feet off the supposed spectator. In other words, taking the absolute plane in which you stand, everything which advances or recedes from that plane will, either in mirror or lens, have its perspective length or shortening doubled; that is, the size of the object represented will not be double, but the perspective increase or diminution of size will be doubled. If you yourself step forward three feet, your image also seems to step forward three feet, and your perspective size has increased by definite laws, not the three feet you actually advanced, but six feet. So if you remain stationary and advance your hand the three feet, you have really multiplied the perspective of your hand and arm by two, so that while the reflected size of the body remains as before, you see your arm and hand as a photograph would show it, and the hand would appear such as belonging to an arm six feet long.

There is a very easy way of measuring this exaggeration of perspective for all distances; viz., taking the oval of the human head and face at about ten inches; on a slip of glass gum some bars of paper at two inches apart; stand in front of a mirror (say at twenty feet off it), place the glass with the bars in the plane of your face, and the face and head will appear to fill five of the spaces between the bars; hold the glass two feet in front of you, and as you look through it at the reflection in the mirror you will find that your oval of head and face will only fill four of the spaces. Now, if you go forwards to a distance of four feet from the mirror, and you place the barred glass in the plane of your face, you will find the oval fill the five spaces as before; and if you advance the barred glass two feet, as you did in the former experiment, you will find, as you did before, that face and head will fill only the four spaces, so that the exaggeration of the perspective would seem to be equal for all distances, and, *ergo*, it would seem that, as lenses obey the laws governing the reflection in the mirror, that, long or short focussed, they would act alike. This would be an error, for a new element comes into operation in this way: At twenty feet off the mirror the exaggeration of the perspective would be only one-tenth of the apparent distance of the object reflected, whereas, at a distance of four feet from the mirror, it is evident that it would be one-fourth of the apparent distance. Therefore, in lens or mirror, although the absolute perspective exaggerations would be the same for all distances, its effect upon the spectator would vary in proportion to the distance; and to illustrate this I have to go to some of the laws of perspective itself.

The artist, or the perspective draughtsman, uses an artifice: he draws objects which really are on a horizontal plane and at various distances from him on a fixed vertical plane, in such a way as to appear to the spectator as if the real objects were still on a horizontal plane, at their proper distances, and seen through the transparent vertical plane which he calls his "picture." The laws by which he is guided are very definite and well determined, so that any marked deviation from them gives rise to a very uncomfortable sensation, although the precise cause may not be at once apparent. I am not going to inflict a treatise on perspective, although to prove my point I must allude to one or two of its laws. To begin with, then, the artist has a point on his horizon (visible or concealed) to which he is supposed to have his eye constantly directed; this is called the "point of sight," and on plane perspective he has also two points, one on each side his point of sight, which he calls his "points of distance"; these points he can fix on himself according to the nature of the subject he is engaged upon;

but his points of distance usually are about as far from the point of sight as the spectator is supposed to be from the vertical plane upon which the artist sketches. What would be the effects respectively if this "point of distance" were taken as too far removed or too near the point of sight? Why these: If too far off, the objects represented would appear flat and poor, and have no effect of depth or roundness; if too near, then the objects would be exaggerated in their depth, they would "stand out too much," and those in the foreground would appear especially out of proportion. So it is laid down as a rule that the point of distance must not only be outside the picture, but that it ought to be some distance outside it; how far is, as I said, left to the discretion of the artist. His lines to the "point of sight" must be intersected by those to the "point of distance" indicating the perspective "depth" of a solid object; so, of course, he arranges in such a way as to produce as much roundness or effect of relief as possible, without rendering his object pseudoscopic.

Now I think it will be seen what I am aiming at. I take it that the approaching very near an object with a short focus lens, in order to get a particular object represented of a certain size, is identical with the attempt of the artist to get his "distance point" all but into his picture. The use of a lens of inordinately long focus, I take it, would be equivalent to the artist placing his "point of distance" so far away as practically to induce a flat, poor effect. Mind, I am assuming all this time what I really believe to be true, viz., that in all cases the lens just doubles the real perspective of objects in different planes; and with that proviso, let us see what all this teaches us as to the comparative advantages and disadvantages of long and short focussed lenses.

In a long focus lens we know there is less spherical aberration over a given area, and a greater number of planes in the composition will come into correct focus; but to put against this you have the fact that objects will have a tendency to look flat and tame, and will detach themselves with difficulty from the background. The fact is, I suppose, that the lens looks at objects as a man would who had only one eye; and if it were not for the artifice of the exaggerated perspective, objects would not seem to stand out as well as they do. Another reason why the lens should exaggerate in moderation: photographers know well that the human head is always in movement, and this gives rise to parallax; that is, objects in different planes behind each other seem to move, and so give the impression of reality. Thus the excess of perspective seems here to be really required to render the effect of roundness to objects which distant monocular vision would seem to render tame. The short focus lens of course exaggerates this relief or roundness, and so gives the impression of vigour and solidity; and it has also this advantage, that there is less thickness of fog or dust-laden atmosphere to work through; but it would seem to have this disadvantage, that you are practically getting your point of distance all but into your picture, and that, as your composition must necessarily be restricted to one plane, your "art of concealing art" will be more limited in its application. Therefore I believe that, on the whole, moderately long focussed lenses are much to be preferred, and, indeed, I believe they are more generally in use where really artistic effects are aimed at.

Mr. Cherrill will see that I quite agree with the latter part of his thoughtful and practical letter, and that I look upon the choosing of a long or a short focussed lens for particular work as similar to the consideration of the artist when about to take a picture, as to when to place his point of distance.

I hope I have not seemed to dogmatise in all this. I shall be glad to be set right in any point on which I may have been in error; and I conclude by the expression of a hope that the subject will receive full discussion, feeling that there never could be one more fitting for the pages of a journal devoted to the photographic art.

JOHN ANTHONY, M.D., Cantab.

Washwood, October 5, 1868.

WET PHOTOGRAPHY IN THE FIELD.

DEAR SIR,—Just after the commencement of the publication of the PHOTOGRAPHIC NEWS, in about No. 11, I recommended the use of syrup made with 1 part sugar and 2 parts water, boiled and filtered, to pour over wet collodion plates when working in the field. I have used the above in open-air work ever since, till last summer, when, finding it a sticky, troublesome mess to work in a tent, I adopted another plan. I now merely wash the plates, after development, in a tray with a few ounces

of water, and when working by the sea-side use the 6 ounces of water over and over again, and then transfer the wet plates to a perfectly water-tight plate-box, with a felt lining inside of the lid. After the day's work is done, and the twelve plates boxed, I look out for some clear stream of water, and fill the box to the brim, gently tilt it up and down, and pour it out. The plates keep in excellent order for cleaning and intensifying till my return home, and, if too late in the evening, the plates are put into trays of clean water till the following morning. If water is plentiful on the spot, I partly fill the box, and put the plates to wash without using the tray. This method I have found far more pleasant than using the syrup, and it answers perfectly, even in the hottest weather.—Yours truly,

THOMAS GULLIVER.

PANORAMIC CAMERA.

DEAR SIR,—Some time since I promised to inform you if I succeeded in the then (to me) serious defect in the dark or light line where the two halves of the pictures join. I have succeeded in the following manner: The partition is made movable by a small pin in the centre working in a brass socket, and another pin in the top part passes through the top of the camera; to this is riveted a small piece of watch-spring; across the spindle is a short, flat piece of brass. Now, when exposing the plate, it is only necessary to give the cross-piece a slight touch, and then the partition board in the centre of the camera vibrates with a tremulous motion to and fro during the exposure of the plate. This, in a manner, vignettes the one-half of the view into the other, and softens off that unsightly line that has hitherto annoyed me.—Yours truly,

THOMAS GULLIVER.

18, Union Street, Swansea, October 4, 1868.

SOUTH LIGHT.

SIR,—I think Mr. Cherrill, in his article on North and South Light, was (to say the least) very one-sided, and I think little good, and much evil, may arise from it.

Mr. Cherrill asks (after doing his utmost to prove that it is impossible to take good pictures in a studio lighted from the south), "Why are not all studios lighted on the north side?" forgetting, I presume, how many photographers have to make their studios as circumstances allow. Mr. Cherrill says not a word about dull days, which, in this country (if we except this year), are more numerous than sunny ones; and I think even Mr. Cherrill will admit that a south light is equal, if not superior, to a north one on dull days.

I should very much like to know who is the enthusiastic south-light gentleman who says, "I close all the windows with dark curtains," as I think such a person exists not except in Mr. Cherrill's imagination, having been drawn specially for comparison with his very scientific pill-box. Mr. Cherrill knows, or ought to know, that there are other ways of checking the sun's rays than by dark curtains (white tissue paper, for instance); and that, by its judicious use, not only some effects—or, as he would have it, sun effects—but any effect that may be desired, can be got.

That studios lighted from the north are the least troublesome I admit; but I could not let the value of south light be so much depreciated without a word in its favour. To assure you I do not write without experience, I may say that I have the sun on my windows almost whenever it shines, and that at no time am I troubled with its presence inside the room; yet I use no dark curtains.—Respectfully yours,

S. BEVERLEY.

Oldham, October 1st, 1868.

WET COLLODION WITHOUT WATER.

SIR,—In your Journal of October 2nd I particularly noticed Mr. Robinson's article respecting Wet Collodion without Water, in which he states that he omitted to mention the alcohol to be mixed with the golden syrup. I may mention that since I have taken up landscape photography, which has been for the last ten years, I have never used alcohol in my developer or bath, or in any way at all. Instead of alcohol I use more acetic acid, which I have always found to work well; but for experiment I put—

Alcohol ...	...	...	...	...	½ ounce
Iron ...	...	...	...	...	120 grains
Ammonia ...	...	...	...	...	1 to 2 drops
Water ...	...	...	...	...	8 ounces

for my developer. Having no alcohol with the syrup, I found, on pouring it over the plate, stains and smears were caused; but, on the contrary, when the alcohol was put with the syrup and water, I found it to flow evenly, and to leave the negative clear and transparent; showing to all those who are not experienced hands at manipulating that they had better use alcohol if they want to succeed. But as I never use only syrup and water without alcohol in any way, with proper management I have never had one out of a dozen stained plates from that cause. I have this week forwarded you a whole-plate picture, printed from a negative taken eight days old, and should like to have your opinion on it. It was taken with one of Ross's whole-plate doublets. After exposure, I proceed to my laboratory or dark room, and pour over a sufficient quantity of iron solution to cover the plate. This is important where no alcohol is used. As soon as the picture is sufficiently out in detail, I pour the developer very slowly off, at the same time pouring the syrup and water on at the opposite corner to that where the developer is going off. As soon as the syrup covers the plate I place it in a swing-rack while I am preparing another plate. I then take it down, place it in the negative box, the bottom of which is always kept wet. As I am often away a week without touching the plate after the syrup has been poured over, I may remark that when I take the negative from the box I pour over the plate a weak solution of alcohol and water, and, after sufficiently soaked, I well wash, and intensify if necessary. Next week I will forward an enlargement from plates treated in this way. After trying all the solutions of common salt and alcohol to chloride of calcium and other solutions, I find none are so good and produce such good results as that of Mr. Robinson, to whom I, as well as a good many more, will be greatly indebted.—Remaining, Mr. Editor, yours obediently,
Lyham, near Buxton and Ealing. JAMES BLANE.

PS.—It is worthy of mentioning that the print represents the residence of Mr. W. E. Jenkins, of Forest Hill, so well known for his kindness to the poor of that neighbourhood.

[The print enclosed is clean and satisfactory, illustrating that the negative did not suffer from the long delay in finishing it.—ED.]

Talk in the Studio.

A PHOTOGRAPHER'S RELIEF FUND.—A correspondent says:—"Much has been said and written in regard to this most necessary and much-needed organisation, making it very evident that it only wants a little pressure and general working together to get the wheel into the groove, and send it securely and successfully onward. In all that has been hitherto advanced on the subject, one point appears to have been completely overlooked and unmentioned, and that is the comparatively few men or women who follow photography alone as a profession, trade, or calling, compared with the great number who join photography to some other businesses carried on by themselves, their wives, or families. Now as these persons are for the most part stationers, chemists, watchmakers, tobacco and cigar dealers, fancy toy sellers, lodging-house keepers, or persons of some calling quite distinct from photography, they will be found in general to be members of some club or society mixed up with their original business; so that, having made themselves secure for a rainy day, they take little or no interest in the establishment of a purely photographic fund; but there are, no doubt, many kind and good-hearted individuals among the trades I have mentioned who would gladly contribute if the thing was only fairly lunched and set going. Her Majesty and the royal family are great admirers and patrons of the art, and would most probably be donors and contributors to the fund. The same may be said of the greater part of the nobility, gentry, and clergy, many of whom would gladly assist in furthering so desirable and much-needed an object.—[We fancy our correspondent overrates the number of photographers who follow some other trade as well as photographic portraiture. There is a sufficiently large number of operators, printers, &c., to render the question of an organisation important. We should prefer to see it take the form of a provident or benefit society, but there could be no harm in having a benevolent fund associated with it.—ED.]

BLACK TONES.—A correspondent, Mr. Edward L. Bridge, writing from Deal, says:—"I notice in the PHOTOGRAPHIC

News, July 10th, 1868, No. 514, a formula for toning and fixing in one bath, similar to one long known to me. It stands thus:—

Nitrate of lead	...	...	30 grains
Common salt	...	...	40 "
Hyposulphite	...	...	4 drachms.
Gold at will.			

This bath will give rich blacks. They are mellow and beautifully refined, even in the high lights. The bath, when for immediate use, must be mixed in warm water, and must be used fresh each time, or the print will go yellow. The prints must not be washed before toning."

WEDDING CARDS.—It is stated that in France, instead of sending to friends the ordinary engraved name card of the bride and bridegroom on marriage occasions, the custom is beginning to obtain of sending photographic portraits—either two card pictures, entwined with the symbolical silver cord, or a single card containing the portraits of the happy pair prettily grouped. The idea is an excellent one, and, if carried out, will afford opportunity for the production of cards with suitable designs to enhance the fitness for the purpose.

HELP WANTED.—An announcement in our advertising columns calls attention to the distress and need of help of a photographer's widow, for whom Mr. Beattie, of Clifton, will gladly receive contributions. How long will photographers subject the indigent and destitute among their ranks to the precarious chances of casual charity, instead of establishing a provident fund?

POLITICAL PORTRAITURE.—A new form of candidate's address, &c., lately suggested by a City firm, deserves attention. "It consists," says the circular, "of a photographic portrait of the candidate, with four pages of letterpress for the address, or a short memoir, done up in a coloured wrapper, similar in style to those we have printed for Dr. —, of which a specimen is herewith forwarded. In this form we feel confident the address could not fail to command the attention even of those wholly indifferent to politics; and by the photograph being frequently shown would thus secure, indirectly, a publicity impossible to attain by other means." After giving the names of two photographers who will be glad to make an appointment for the necessary sitting, the terms are stated thus:—

"Photographic portraits, mounted on India-tinted plate paper, with four pages letterpress, stitched in a neat, coloured wrapper, 500 copies, £21; 1,000, £32 10s.; carte-de-visite, with six or eight lines of letterpress on back, 350 copies, £6 6s.; 500, £10; 1,000, £18." Here is certainly a chance for gentlemen who consider their faces important items in their political fortunes. —*The Stationer.*

To Correspondents.

WILLIAM STURGEON.—The use of iodide of potassium is, as a rule, inadmissible in collodion, where a large proportion of bromide is to be added as well, because of the tendency in the bromide to leave its base and form bromide of potassium, and bromide of potassium is very sparingly soluble in collodion. The undissolved powder in your collodion is doubtless bromide of potassium, which has been formed by double decomposition of the bromide of ammonium and iodide of potassium. The bromide of ammonium would have dissolved as before, and no precipitate would have been formed, if you had used iodide of ammonium as previously. The best plan now is to decant the collodion carefully from the sediment for use. Although the total quantity of the bromide added has not dissolved, still you may find that sufficient has been dissolved to enable you to get good results.

C. C. C.—For a travelling studio a van would, we think, be more convenient than such a tent as you propose; but, of course, it would be dearer. 2. The glass in the diagram you send is in the right place. 3. We fear that it will be insufficient for satisfactory working. We should prefer not less than 8 feet side and roof; on the north side would be preferable.

A. G. H.—The multitude of minute yellow spots, which do not appear until six months or more after the prints are mounted, we can assign no reason for. We will keep the matter before us for further investigation, and will let you know if we arrive at any useful conclusion. In the meantime we should discontinue the use of gum water for mounting.

ANXIOUS.—Of the lenses you name, No. 4 seems most likely to answer your purpose, and is the most rapid. Either of the triples you name will include, with good definition, an angle of about

60°, or more with a small stop. We cannot with accuracy give you the relative exposures of the lenses you name, beyond stating that No. 3 is, we believe, more rapid than either of the preceding, and that No. 4 is, *ceteris paribus*, most rapid of all of them. The American lens you name is, we believe, pretty good, but the angle stated is an exaggeration; we have no reason to believe that it is equal to the lenses of either of the English makers you name.

A. DONS.—We know nothing further of the "automatic syphon" than was stated in the letter we published. 2. We cannot tell you precisely what alteration Mr. Cherrill would suggest in making a distinction between vignette and solidly printed pictures; but we may remark that a very little reflection will satisfy you that for vignettes you require a lighter and more delicate image altogether than would be effective in a picture fully printed out. In the latter you can afford to have massive depth and richness, whilst in the vignette you must have tender shadows and a sketchy lightness throughout.

X. N.—So far as we can judge by the appearance of the print you enclose, we should conceive the colour to be due to acetate toning. In any case, the acetate bath will produce very similar results. Take 1 grain of chloride of gold, 30 grains of acetate of soda, and 5 ounces of water, and mix. Use 48 hours after mixing.

COLLODION.—We will make some enquiry, to ascertain, if possible, a remedy for your difficulty. The plan of washing with repeated changes of alcohol would doubtless remove the water completely, and permit varnishing to be effected; but it would, in the first place, be a somewhat expensive operation; and, in the next place, the varnish, applied whilst the film was still soft and permeable, would probably penetrate very much, and tend to reduce the density. Have you tried applying gum water after fixing? We cannot help thinking that either the collodion you employ is not suitable, or that, from a little under-exposure, prolonged development is necessary, a condition which tends to rot the film. 2. The rapid lens you mention is as suitable for landscapes as the triple.

VENATOR.—The illustrations in a book such as you describe generally possess the same period of copyright as the book itself. The copyright in a book continues during the author's lifetime and for seven years after his death; or for forty-two years, if these periods put together do not extend to that number of years.

NONE ET SEMPER.—The common material used for powdering the skin or hair is "violet powder"; common wheaten flour or starch may be used. Perhaps nothing will answer better than wheaten flour. There is no danger in its adhering in so thick a coating as to render the white tint too obvious, unless it be very clumsily applied.

W. J. A. G.—A good tone can only be obtained from a good negative; but the experience you detail, which would tend to show that only one class of tone can be obtained from one negative, is very curious. Perhaps the most that can fairly be deduced from it is the conclusion that a given class of negative most readily and easily gives a certain kind of tone. We have ourselves produced almost all kinds of tones from the same negative, and from a good negative almost any kind of tone can easily be produced. Difference in tone is due to two things: first, the quantity of metal reduced; and, second, the size of the molecules in which it is reduced; and whilst, with a good negative, very similar tints can be obtained with many different toning baths, yet, on close observation, it will be found that the substances associated with the gold modify the size and condition of the molecules thrown, and hence each bath has a tendency to the production of specific colours in toning.

A. TAYLOR.—So far as we can judge, the mirror is produced by a deposition of silver, either by Liebig's or Cimeg's process, most likely the latter, of which you will find full details on page 398 of our Sixth Volume. The silver is deposited on glass from a solution of ammonia-nitrate of silver to which Rochelle salts have been added. It would require too much space to describe the method fully here.

B. L. P.—The prints are very fine, but the tone is too cold for our taste. If it had been warmer, the effect would have been much richer. The deepest impression is best. It is necessary to register before selling any copies, in order to make your copyright safe.

M. R.—The erapiness you describe is most probably due to the use of solvents containing too much water, and is therefore a defect very difficult to remedy. You may render its effect less marked by allowing the film to set well before immersing in the nitrate bath; or it may be added to another sample of collodion made with anhydrous solvents. 2. As a rule, we should not use more than about one grain per ounce of a bromide in collodion for portraiture.

OXONIENSIS.—There is no work devoted to the subject of double printing, &c. 2. You will find on page 471 of our Eighth Volume the best description of the method of double printing. There is also a similar article in our Year-Book for 1864. Should you not have access to these, we shall have pleasure in giving a few details in this column.

RECEIVED: "A Treatise on Optics," by E. Nugent. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

PAGE	PAGE
To Whom does a Portrait Negative Belong?..... 493	Notes on Photographic Subjects. By M. Carey Lea..... 500
Photography or Branding?..... 494	Proceedings of Societies—North London Photographic Association—South London Photographic Society—Liverpool Photographic Amateur Association..... 501
Decision as to a Photographer's Personal Luggage..... 495	Correspondence—Publishing Prints from Purchased Negatives 502
Studios and Processes in America..... 495	Talk in the Studio..... 503
Progress of Carbon Printing..... 497	To Correspondents..... 503
Pictorial Effect in Photography. By H. P. Robinson..... 497	Photographs Registered..... 504
On the Relation between Intensity and Tonic. By Nelson K. Cherrill..... 499	
Some Remarks on Stereoscopes. By Valentine Blanchard..... 499	

TO WHOM DOES A PORTRAIT NEGATIVE BELONG?

A CURIOUS question has been brought under our attention recently, one which has been raised before, but never, so far as we know, authoritatively answered. To whom does the negative belong which a photographic portraitist takes in the regular exercise of his profession? A thousand voices will, we doubt not, be ready to answer at once, "To the photographer, of course." Very naturally answered, and, as we believe, very truly; but clearly not so as to secure universal acquiescence. Let us illustrate at once by laying before the reader a letter we have received from Mr. Rejlander:—

"DEAR SIR,—I have had a novel application made to me by a gentleman in Scotland, viz., to obtain from me three large negatives representing his daughter in various well-invented attitudes. When I say novel, I mean it in this sense: it was not asked for as a favour, or by purchase, but as a right, assuming that he was the rightful owner, and claimed them as his. I must say he was prompted to obtain them by knowing I was going to remove to Victoria Street,* and, fearing I would not take sufficient care of my negatives during removal, they would run less risk in being sent to the North.

"I can well understand his anxiety, but not his expression that 'the negatives are mine,' nor that of his counsel, who 'is of the same opinion.'

"I should be in a pretty pickle if I were made responsible for negatives I do not care to keep. If claimable properly, I might be held liable for damage, and the harder I worked the poorer I would be.

"Has there not been a question like this before some judge? I fancy I remember something about it, and that it was left unsettled; but the sooner it were settled the better, and that we may claim hire for the safe keeping of the glass, as some say it is 'only a bit of glass.'—Yours very truly,

O. G. REJLANDER."

To clear the question of any extraneous considerations, it should be distinctly understood that these are negatives taken in the exercise of his profession as a portraitist, not pictorial studios, such as Mr. Rejlander often produces. If they had been the latter, perhaps still less doubt on the question might have existed; but we mention this fact to clear the ground, in order that it may be distinctly understood that the question arises in relation to portrait negatives taken in the regular course of business. When the demand was first made, Mr. Rejlander naturally demurred

to surrender that which he regarded as undoubtedly his own property; whereupon the claimant sought legal advice, by which he stated he was fully supported in his claim and assertion that the negatives were his property.

The question, it cannot be doubted, is one of the most vital importance to photographers, and might be made to involve most startling issues. If the claimant and his legal adviser are right, and the claim they make were made and sustained by the general public, not only would the value of every photographic business in existence be woefully depreciated, but the majority of photographers might be ruined, not simply by their losses of property in the stock of negatives which they have regarded as their own, and which has afforded a steady income of greater or less amount, but by actions for compensation in regard to the thousands of negatives they have destroyed, never dreaming that they were not their own property. When a photographic business has been sold, the extent of the stock of negatives from which constant orders were printed has usually formed one of the chief elements in the estimate of the value of the business; and the transfer of such a stock of negatives has been regarded not simply as the sale of such property of specific value, but as the efficient means of transferring the goodwill of the business. We have known of the sales of several such businesses involving in the aggregate many thousands of pounds of purchase money; but if actions for compensation in relation to the negatives in such cases could be sustained, we imagine that considerably increased duties for Her Majesty's Commissioners in Bankruptcy would follow.

To return to the question, however, To whom does a portrait negative belong? We should answer, unhesitatingly, that it belongs to the photographer; and were it not for the proverbial uncertainty of the law, we should never have a moment's misgiving as to any legal decision on the subject. An absolute decision in any case of disputed property can only be given in a court of law or equity; but as, in matters where no statutes exist, the decision is generally based upon precedent and custom, it may be interesting to consider the bearing which custom and analogy have on such a question.

We believe that no legal decision exists which could form a precise precedent in regard to the ownership of negatives, and we should not, in any case, enter into legal technicalities in relation thereto; but we may briefly suggest the considerations in regard to custom upon which common law is often based. Theoretically, the law is the perfection of reason; and practically, errors excepted, probably justice is in the main secured by it. In the case *Mason v. Heath*, in which the plaintiff brought an action against the defendant for refusing to supply him with a portrait negative at a reasonable price, the whole of the proceedings were based on the assumption that the negative was the property of the photographer who took it. The actual question of ownership in the negative, as between the photographer and the

* Our readers will be glad to learn that Mr. Rejlander is shortly about to remove to a magnificent West End studio, now in course of erection, where, we believe, there is every prospect of his rare abilities as an art photographer being fully engaged, and meeting with the high appreciation they so unquestionably deserve.—ED. PHOTOGRAPHIC NEWS.

sitter, although it has been frequently raised, and always maintained satisfactorily, we believe, by the photographer, has not, so far as we remember, come before any court. We remember one instance in which one of our ablest photographers, having taken several portraits of a certain high personage, did give up, in accordance with the request made, the negative as well as the prints ordered. This was by no means, however, intended as a surrender of the rights of ownership, for when the account was sent in, each negative was duly charged at a price distinct from that of the prints ordered. The business representative to the high personage in question took exception to this account, and sent it back with each charge for a negative struck out, and remonstrated against the excessive charge for what he styled "a piece of glass—a piece of glass!" The photographer, with quiet self-respect, pointed out that a negative was not in any sense merely a piece of glass, but the *cliche* from which thousands of valuable pictures could be produced; he therefore maintained his right to the charge he had made, and received it.

The custom of the profession, recognized and acquiesced in by the public, could of course be proved by a thousand instances. We were told, by an English gentleman, that on visiting the studio of M. Adam-Salomon last year, he asked the young lady in attendance if he could have his negative, and on what terms? "Not for a thousand pounds; M. Adam-Salomon in no case parts with a negative," was the response. "And, pray, why not?" was asked. "Because he has a reputation to maintain, and this must be done by the mode in which proofs are printed, and the care taken to make them permanent. Bad prints in circulation from negatives known to be his might seriously injure him." M. Silvy, on retiring from business, for months advertised that persons who had sat to him could have their negatives on a certain payment. In fact, the whole practice of the profession proves that it is the custom for the photographer to affirm his ownership, and the public to acquiesce.

The customs of all other trades by analogy support the same position. When the manufacturer of a steam-engine, or any similar piece of machinery, receives an order for a specific engine, a number of designers and draughtsmen are at once set to work to produce the scheme of the engine on paper. Next, a number of pattern makers are employed to make various patterns in wood, from which to produce moulds for all the castings. The person for whom the engine is built might with equal propriety demand the moulds, patterns, drawings, and calculations which had been prepared as necessary adjuncts in the construction of the engine, as the sitter demand the negative necessarily taken as a means of supplying the portraits; the painter might be required to give up the studies and sketches taken as aids in the production of any picture; the type-founder might be required to give up the matrixes in which a fount of type, produced to order, was cast; the printer might be required to give up the forme of type he sets to produce a circular or poster; the frame-maker might be required to give up his patterns and moulds; the tailor to give up his patterns and measures; and so on in many other instances. We here refer, not to general trade tools, but to cases in which something is specially prepared as a means to the fulfilment of an order, just as a negative is a necessary step in the production of a portrait, for a negative is no more a portrait than a matrix is a type or a mould a casting.

The only analogy of trade we remember, which might seem to point in an opposite direction, does not do so in reality. We have heard it urged that when a person orders an address card to be engraved, and a number of cards printed, the plate is always delivered with the cards, and regarded as the property of the customer. This is so, we believe, generally; but that it is an exception to general practice is emphasised by the fact that it is the custom of the trade to make the special announcement, "A card-plate and 100 cards for so much." If the plates were

delivered with the cards as a matter of course, no special mention of it would have been necessary; but the circumstance that it is so specially mentioned in the trade announcements of engravers points to the fact that it is an exceptional and not a common practice in trade to give up a mould or a *cliche*.

The nature of a photographer's contract with his customer is simple enough: he engages to produce a given number of portraits at a given price. His contract is fulfilled when he has delivered these portraits and received the price; no question of the ownership in the negative necessary to the production of these portraits should arise beyond this: the sitter possesses a clear right to forbid the production of further prints from it without his consent. This is a tacit understanding between the photographer and his sitter, and it is rarely violated.

Possibly the law of copyright may throw a little light on the legal question, for where no provision to the contrary exists, the ownership of the negative would generally follow the ownership of the copyright. The clause in the statute, stating the conditions of ownership in the copyright of a photograph, provides that if a photographer take a negative for his own purposes, and not as a commission, the copyright belongs to him; but if it be produced as a commission—as a portrait usually is—then it is necessary that an agreement in writing be entered into at the time of the production, in order to secure the copyright either to the photographer or to the person giving him the commission. But if no such agreement be entered into, the copyright belongs to neither, and is, in fact, lost. If we follow the analogy of the case, it would result that where, as in the ordinary transaction of business, no copyright is acquired, no property in the negative—that is, in the image—could be acquired; the glass upon which it rests clearly belongs to the photographer, the image upon it constituting the negative; he can, therefore, clean it off if he choose, or he can, as a matter of convenience, keep it in existence for the future accommodation of the sitter; but it is clear that the latter could not, according to the analogy afforded by the Copyright Act, acquire any property in the negative.

The loss, risks, and inconvenience which would be involved if the sitter became owner of the negative can scarcely be estimated. Besides the immediate and contingent money loss, the possible loss of reputation, such as that suggested in M. Salomon's answer, would be serious. Again, prints from a photographer's negatives being sent out from various establishments, possibly with other names attached, loss of legitimate reputation might follow from that cause, and one strong stimulus to excellence would be destroyed. It is not necessary, however, to enter into detail on the evils which would follow such a decision. They are numerous and patent enough. But should the law ever decide that the sitter was owner of the negative from which his portrait was taken, the photographer would be simply placed under the necessity of defining his contract, by publicly announcing in his reception-room and studio that the property in the negative was always retained, and, in any form of receipt, distinctly stating that the payment is for a given number of portraits, not including the negative.

PHOTOGRAPHY OR BRANDING?

ATTENTION has recently been called in a daily contemporary to the degrading and brutalizing effect of the practice in the army, which still occasionally obtains, it appears, of branding an offender with some indelible mark, so that he shall bear the stigmata for life of the crime, and the disgrace attending it. All punishment is, of course, degrading as well as painful, as it should be; but the degradation is rarely, and should never be, of a character which clings for life, no matter how deep the repentance, no matter how full the expiation, or how complete the amendment. But the brand B. C.—bad character—burnt on a man's skin

is too often burnt into his soul, and he becomes permanently the thing he is permanently labelled.

But a means of absolute identification is necessary when a man has been "drummed out" of his regiment, in order to prevent his re-enlistment, and again entering under another name Her Majesty's service. The branding serves this purpose. But the question arises, can its aid not be superseded by something quite as efficient, and much more consonant with the civilization of the age? To meet the difficulty on the score of identification photography has been proposed. The photograph of a criminal has been found in gaols an efficient means of identifying him when he comes within the clutches of the law a second time, and has often been made the means of capturing him when flying from justice.

An army surgeon, writing to our contemporary, points out that the brand-sear is not always efficient as an aid to identification, and thinks that, properly managed, photographing men will be found a much better system of detecting old criminals than the plan of branding them. He says:—

The plan of identification by means of photography has, therefore, the merit of expediency as well as humanity; but I fear the resemblance to a likeness taken under far different conditions is too nice a point for the decision of a serjeant. Be it remembered, also, that it is manifestly contrary to his own interest to raise any point which, like this, may readily escape the notice of his superiors. I would therefore venture to suggest that the portraits might be deposited with the magistrate before whom the recruit is sworn in, and thus the requirements of those regiments be met who have no inspecting officer.

The use of photography as an aid to the detection of criminals is one of the sterner missions of a very beautiful art. If, in the exercise of these missions, it can be made to supersede and abolish a brutalizing and degrading remnant of a much darker day, it will afford some gratification to all those of its votaries interested in the "eternal fitness of things."

DECISION AS TO A PHOTOGRAPHER'S PERSONAL LUGGAGE.

The decision in the case to which we recently adverted, in which the question was raised as to what constituted a photographer's "personal luggage," has been given, and will, we fear, scarcely prove satisfactory to photographers. It will be remembered that Mr. Owen Angell, of Exeter, travelling on the South Devon Railway with his photographic apparatus, for the purpose of fulfilling a professional engagement, his luggage was removed at Teignmouth instead of being carried on to Bovey Tracey, whither he himself was going. Having been delayed in the exercise of his profession by the absence of his apparatus, Mr. Angell brought an action for compensation against the Company in the County Court at Exeter. The demand for compensation was resisted by the Company on the ground that photographic apparatus was not personal luggage, and that they were therefore not liable. The decision, which was postponed on the first hearing of the case, was given on Friday last.

Mr. Sergeant Petersdorff, in giving judgment, said that as the case was one of considerable importance, he had deferred his decision, in order that he might refer to the most distinct and trustworthy authorities on the point in question. He had therefore referred to Marshall's valuable work, "The Liability of Railway Companies as Carriers." Here it was stated that "the obligations to carry the luggage of a passenger and the responsibility for its safety as common carriers does not apply to goods unconnected with the *personal use, comfort, or convenience* of the passenger." His Honour then remarked that before he endeavoured to test the question at issue, he should refer to some cases that had already been decided. One—that of *Phillips v. The London and North Western Railway Company*—was in principle strongly analogous to the case before him. It was there decided that a solicitor's documents in an action

in which he was professionally engaged could not be considered "personal luggage." The Chief Justice who tried the case had said: "These were not for the plaintiff's personal use, or usually required, but were taken by him in his capacity as attorney for the use of another." There was also a case against the Midland Railway Company, argued in the Court of Exchequer, which appeared to be completely decisive on the identical case upon which they were now engaged. It was there held that an artist's pencil sketches were not his personal luggage. It was therefore difficult to find any distinction between the mechanical contrivance of taking photographic pictures and the pencil sketches of an artist. After alluding to some other cases, His Honour said that the real test must be the question whether the articles were such as would be essential for the personal use and convenience of an individual travelling. If they did not come within that meaning, then the owner was not entitled to seek compensation from a railway company. He would mention one or two strong illustrations. The professional wardrobes and dresses of actors and actresses, which often were of enormous value, were not held to be personal luggage. The same would apply to the robes of judges and barristers, also to bishops and others. He must therefore decide unequivocally that a mechanical apparatus used for photographic purposes could not fall within the description of "personal luggage." The plaintiff photographer would therefore be non-suited.

The decision, as we have said, will, we fear, prove an unsatisfactory one to photographers, and appears to us based upon a technical quibble rather than common sense. The companies engage to carry a passenger and a given weight of luggage for a given price, and so long as that luggage does not require unusual care, and does not contain substances likely to injure the property of other travellers, we cannot conceive how the question of the nature of the luggage can concern the railway company, except as a technical means of evading responsibility in case of carelessness or neglect on their part. The statement made by the judge, that the robes of actors and judges, barristers and bishops, would, on the principle upon which he decided, be disallowed as personal luggage, seems to give extraordinary point to the unreasonableness of the principle governing the decision.

That photographers should not place amongst passengers' luggage imperfectly packed chemicals, which, by fracture or leakage, might injure other goods, is tolerably clear, and should scarcely need enforcing; but no question of that kind has arisen here. A wise caution would suggest that a box containing the chemicals, in as compact a form as possible, should be taken by the photographer into the carriage with him. Indeed, we commend this course to photographers, in reference to as much of their equipment as convenient. In case of the use of dry plates and small apparatus this will not be difficult, although scarcely available to the wet worker in a large tent. We can only offer this consolation to photographers, that their right to carry apparatus as personal luggage is not likely to be questioned until they raise some claim for compensation, as it is chiefly under such circumstances that railway companies avail themselves of technicalities to justify the unfair treatment of passengers.

STUDIOS AND PROCESSES IN AMERICA.

An interesting article in our excellent contemporary, the *Philadelphia Photographer*—of the last number of which advance sheets are before us—describes the mode of lighting and the processes used by two of the most successful portraitists in New York—Mr. Napoleon Sarony and Mr. Fredericks. The writer, who is an amateur photographer who has had opportunity of forming the acquaintance and visiting the studios of many of the ablest professional photographers in the States, premises his remarks by observing that he has invariably found that the best men had no secret dodges upon which they relied for success, their

readiness to communicate generally being in the exact ratio of their ability and the excellence of their work. He says:—"For many years an amateur, and having travelled and photographed over a very large portion of our country, I have, during such trips, made the acquaintance of very many of our best photographers, and, as yet, have never met one who made good work who had any secrets, or who hesitated one instant about comparing his method of working with mine; but have, in several instances, been repulsed by bunglers, of whom I had asked questions solely with the view of correcting errors in their work, which I saw plainly the cause of."

He finds one general principle pervading the operations of the best men, from which he deduces the conclusions embodied in the following advice:—"First. As to the sky-light. No matter which way it faces—north, south, east, or west (good work can be made under either)—let the light be directed upon the sitter, not towards the camera, as is too often the case. Shield the camera from the sunlight, or strong diffused light, either by placing upon the roof some contrivance which will effect the purpose, or cover the tube by a hood. The more diffused light there is about the room the duller, flatter, will be your picture. The stronger your light the less iodides and bromides you should use in your collodion, and the weaker your developer. To obtain the much desired middle tint or detail in the shadows, give plenty of time, and use a quite weak, slow-working developer, avoiding the extreme of intensity."

The first of the visits he now undertakes to describe, was to Mr. Sarony's studio in the Broadway. Mr. Napoleon Sarony was, by original profession, a lithographic draughtsman, and an exceedingly skilful artist. He is the younger brother of Mr. Sarony, of Scarborough, of whom, as a photographer, he was a pupil. He was for some time engaged in Birmingham, and his work, as well as that of Mr. Oliver, had a high reputation in this country. The account of his New York studio will be read with interest. In our contemporary it is described as follows:—

"His reception room—about twenty by sixty feet—is a model of artistic elegance, the walls and tables being covered with specimens of his finest productions, which, to those who know them, is all I need say; while to those who know them not, I propose to them to visit and inspect. They will be politely welcomed by Mr. Sarony, or his partner, Mr. Campbell.

"Upon the floor above, within a room of same size as the one just mentioned, are the skylights, operating rooms—not closets, but good-sized, well-ventilated 'dens.' The building stands nearly east and west, and the lights are both facing the north—one at each end of the room—and so nearly alike in size that a description of one will answer for both. By having the two lights he is not only able to do double the work he would with one, but is able to obtain almost any effect of light and shade that will best produce the desired end, to choose the best side to light up each subject, and operate accordingly, which could not be done with one light. Along the eaves of the building each light extends thirteen feet, which I shall call the length; thence back and upward (at an angle of thirty degrees) thirteen feet; and from the upper or back slopes down, tightly boxed in, at an angle of about forty-five degrees, to the roof, giving a square top-light. The side-light joins the top-light, and is of same length (thirteen feet), and three feet down, or wide, ending in a point five feet above the floor. The ordinary window glass is used, neither ground nor coloured. As the same style of shades are used by both parties, I will describe them hereafter.

"The collodion in use is iodized as follows:—

Iodide of ammonium	...	...	4 grains
Iodide of cadmium	...	...	1 grain
Bromide of cadmium	...	...	2 grains.

Develop with weak ordinary iron developer, and, if necessary, strengthen with pyrogallie acid and silver, of which every one knows.

"The printing is, of course, done upon his own paper, which is floated about one minute upon a plain 60-grain nitrate of silver solution, which is kept clear by shaking up with kaolin, and filtering.

"Any good toning bath will answer. I, however, give the one he always uses.

SARONY'S TONING BATH.

Chloride of gold	...	...	15 grains
Water	...	...	2 ounces
Whiting	...	...	a teaspoonful

Shake well, then pour on boiling water until the yellow disappears. Filter, and add three drops of a saturated solution of chloride of lime.

"This bath is easy to work, certain in its results, and can be used several times; in fact, the tone of the prints is superior after using the solution some days. When the day's prints are toned, pour the solution through a filter into a bottle.

"Before using again, add 5 grains of chloride of gold and 3 drops of a saturated solution of chloride of lime.

TO FIX.

Hypsulphite of soda	...	...	4 ounces
Water	...	...	30 "

Immerse for five minutes, and wash in the usual manner. Is there any mystery here?"

Mr. Fredericks is one of the oldest established and most successful photographers in New York, holding high position and doing a very extensive business. One peculiarity of his studio, it will be noted, is the fact that all his light enters through ground glass, the aim being somewhat contrary to common, and what is considered orthodox, practice, to obtain a large volume of soft light rather than a more brilliant light through a more circumscribed space.

"Mr. Fredericks works two lights, both essentially different. Either, in unskilful hands, would prove useless, but directed by Mr. Hugh O'Neil (partner in the business), who specially superintends the chemical department, and Mr. John De Bains, whose skill under the light cannot be excelled, work is produced, unsurpassed in all respects.

"The upper light (on fourth floor) is a skylight only. It faces north-west, is of ground glass, fourteen feet square, at an angle of thirty-five degrees, and slopes away and down to the roof, solidly boarded up at an angle of forty-five degrees. At the lowest point, or base of light, it is nine feet above the floor.

"The lower light (on third floor) is a side and top-light combined.

"The top-light extends in length along the eaves of the (rear) building, thirteen feet, thence up, and back (at an angle of twenty degrees) fifteen feet. The side-light joins the other, and is of same length (thirteen feet), extending towards the floor nine feet, and to within eighteen inches of the floor. All the lights are glazed with the whitest and best ground glass. The light on the third floor (one last described) has sliding inside sashes of blue ground glass, which are drawn or pushed over alongside of the other or outer light. This is found necessary in this one, which faces south-west, from the fact that it is nearly always directly in the sun's rays. It is fitted with the ordinary style of curtains or shades, hung in narrow strips, by which any part can be drawn up or down, giving the light any direction towards the sitter that may be desired.

"The upper, or fourth-floor light of Mr. Fredericks, and the top or skylight portion of Mr. Sarony's lights, are provided with a very excellent style of screen, by which the light cannot only be reduced in quantity, but its direction can be changed as well. For example, if we take one of the lights thirteen feet long, dividing this by six it will be found that there are six sections, each twenty-six inches. Now, if the light be also thirteen feet wide (up and down way), the sections are twenty-six inches wide by thirteen feet long. Now make six frames of this size, and cover with blue tissue paper, which put up by means of hinges, or otherwise

attached to the under-side of the top-light, and you have just the thing. It is self-evident that by turning these swinging screens up or down, by aid of cords and pulleys, the effect spoken of can be produced."

It will be noticed that these blinds are analogous to what are known in this country as the McLachlan blinds.

"The formulæ used by Mr. O'Neil are as follows:—

"Collodion, when the light is very strong, like that upon the third floor, he uses—

Iodide of ammonium	...	...	4½ grains
Bromide of potassium	..	...	2 "

For weaker light—

Iodide of ammonium	...	...	5 grains
Bromide of potassium	...	...	2½ "

"Developer: plain iron; strongest under weak light; strengthen with pyro and silver.

"The printing is done upon the papers prepared by Mr. Anthony, and toned in a simple bath of chloride of gold, made alkaline with sal soda (common washing soda), and fixed in hypo.

"Is there any mystery here? None! The great art consists in knowing how to place your sitter properly under the light; when to weaken, when to strengthen, your collodion and developer; and when to stop its action. These come of experience, intelligence, and common sense. They are not told in books or in journals; are only to be had by study and effort on the part of each photographer."

PROGRESS OF CARBON PRINTING.

CARBON printing appears to attract considerable attention in America; how far its commercial application progresses we do not learn. There are already three or four manuals of instruction for working Swan's process in existence in the States: the "American Carbon Manual" of our friend E. L. Wilson, based upon our own, with full acknowledgment; an exact reprint of our own; and another which we have not seen. In the *Philadelphia Photographer* we find some records and suggestions which will be read with interest by photographers in this country. Mr. W. J. Land, who some time ago suggested the use of alcohol in the bichromate solution, to aid in the more speedy drying of the tissue, sends the following additional remarks:—

"Since writing to you I have made further experiments in this, and find the use of alcohol very beneficial in hastening the drying of the developed image. After developing and washing, I make use of a small quantity of (95 per cent.) alcohol, in which I dip or soak for a few moments the picture—by osmosis the greater quantity of water is very rapidly drawn from the print—and complete desiccation takes place in less than an hour. I have dried them in twenty minutes, or commenced the final transfer within half an hour after developing.

"With regard to the use of alcohol in the bichromate bath, I think it prevents the tissue from keeping longer than one day: such has been my experience at the present temperature (98°) of our atmosphere. I send you herewith a couple of prints, made a few days since, using alcohol in both cases."

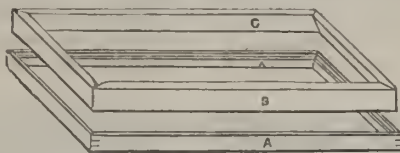
The editor remarks:—"One of the prints inclosed by Mr. Land is silver, and the other carbon. The latter is all we could desire in a carbon print copied from a large photograph, and there is a brilliancy about it which is very pleasing.

"The drying of the tissue, and the caoutchouc paper, are the only real troubles in the process—varying so much with the weather. Moreover, immersing the tissue in the bichromate solution is not as agreeable as floating albumen paper upon a silver solution. The first trouble seems likely to be easily removed by Mr. Land's plan, and the latter is overcome by a very simple and ingenious arrangement, the invention (not patented) of Mr. Quick, of Cincinnati, and a model of which

has been kindly furnished us by our friend Mr. Waldack, of the same place. Both of these gentlemen have the carbon process in successful operation, and have gone into it with a determination to make it successful and popular."

Mr. Waldack, whose name is familiar to our readers as an occasional contributor of interesting matter to the *Photographic News*, writes:—"I am getting ready to make all my large views in carbon. I can get a higher price for them. Mr. Quick has made some very beautiful carbon prints."

Our contemporary gives a diagram of a contrivance, by Mr. Quick, of the improved method of sensitizing the tissue.



"Mr. Quick's contrivance for sensitizing the tissue," he observes, "will be readily understood by the above diagram. Instead of a dish he uses the light frame AA, which is rabbeted inside, about half-way down, the rabbet fitting an ordinary-sized sheet of tissue. The tissue is laid in the rabbet, face up, and forms the bottom of a shallow tray, as it were, in combination with a second frame B, fitted over the sheet into the rabbet. The inside of the frame B is bevelled (c) outwards all around from the top to the lower edge, in order to hold the solution; and it is also supplied with a lip at one corner, by means of which the solution may be poured off. This frame B not only serves to form a tray to hold the solution, but fitting, as it does, the rabbet in the frame AA, presses down upon and holds in place the sheet of tissue, stretching it out straight and even.

"These frames may be made of walnut or other hard wood, and should be varnished with shellac varnish or paraffine. Mr. Waldack writes us:—'Those I use I dipped in hot paraffine, and left them in about a minute, so as to allow the paraffine to penetrate well into the wood.' When in use, the dish is held in an inclined position, the bichromate solution poured in at the lower part, and, by tilting, it is made to flow over the whole sheet of tissue. The great advantages of this method are obvious. It prevents the irregular drying of the solution on the back of the paper, and, leaving the ends quite dry, allows it to be hung up by means of clips, or pins, without sticking to them or the fingers.

"A similar frame is used to coat the sheets of white paper with the caoutchouc solution, or hydrocarbon varnish, as it is called in commerce. This frame, however, need not be coated with paraffine.

"We are certainly greatly indebted to Mr. Quick for this contrivance. It works like a charm, and is eminently preferable to the old plan.

"There is another point mentioned by Mr. Waldack, which is important to those who prefer to make their own hydrocarbon varnish; i.e., that the only benzine suitable to dissolve rubber is that made from coal tar. The petroleum benzine cannot be used. The rubber should be fresh—the white inside of the gum, as it is imported, being best before it is much exposed to the air. The difficulty of obtaining good benzine and good rubber makes it more advantageous to buy your varnish of your stock-dealer."

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN

COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXXVIII.

THE supposed difficulties of photographing children have prevented many photographers from obtaining some of the most beautiful subjects that could come before a camera

Many, even now, when sitters are scarcer than they were, have a great objection to seeing children enter their studios, and resign themselves to their fate in a grumbling humour, as if they were very ill-used in having to deal with such troublesome subjects, which is not the best frame of mind to be in when you are about to deal with children; while others will have nothing to do with anything under six years of age. During the carte mania, it was difficult to get a child's portrait taken at all, except by those whose pictures were so bad that they had little to do, or those who took a delight in the work. I must confess that I am one of the latter, and nothing gives me greater pleasure than to have three or four beautiful children in the studio, with a *carte blanche* as to what I shall produce, and with plenty of time at their disposal. I take a pride in never letting a child go away unaccounted for photographically, however

young or lively. By far the most beautiful photographic portraits that have been done have been those of children; their attitudes are more free and unconstrained than those of older persons, while their expression is generally more natural. The wet process is now so perfect that the exposure, when necessary, may be reduced to a very short portion of time, and all that is necessary to success, apart from artistic knowledge, is sufficient tact in managing the young sitters, who are very clever and quick in finding out whether they are in the hands of a novice or an adept.

One of the most charming groups of children's portraits that have ever been painted is that given in the present illustration by F. Goodall, a class of subject of which the artist was *facile princeps*, before he altered his style and went to Egypt for inspiration. It is called "The Swing," and represents a group of beautiful children enjoying them-



selves under the trees a short distance from the mansion, whose terraced walks appear in the background. Of course it would be very difficult in photography to represent a similar subject, although it is quite possible; but I introduce it here, not only for the purpose of saying a word in favour of children as subjects for the photographer, but also in order to show, as I have endeavoured to do throughout these chapters, that the same artistic laws apply to all subjects, however different they may be in character, and however diverse in effect. For instance, I pointed out in Chapter 34, in which a meeting of Quakers was represented, how the black shoes of the two sitting figures served to join the groups; in the present illustration we have the picture divided into two principal groups, the children seated and standing under the tree looking on, and the little lady in the swing, and the two beautiful boys on each

side of her; these groups are connected together by the light spot formed by the hat in the foreground, which, at the same time, is the supporting base point of each pyramid; place the finger over this spot of white, and the arrangement of lines will appear weak, and without purpose.

Artists should take the greatest care this support is never wanting in their pictures. It may be formed by a light or dark object, by a contrasting line, or by any device that experience or imagination may suggest, but it must always be there. Nothing looks so awkward as a group or figure that cannot support itself. It is for this and similar reasons that the student should well ground himself in the laws of art rather than blindly copy the designs of others who have probably not known what was necessary to the perfectness of a composition or the requirements of an artistic group.

Modern costume is often condemned; but what could be more picturesque, and yet without any exaggeration, than the dresses of the figures represented in this picture?

ON THE RELATION BETWEEN INTENSITY AND TONE.

BY NELSON K. CHERRILL.*

In reading a paper before the opening meeting of the present session of your Society, I feel that I have to contend with somewhat serious difficulties. Never having myself resided in the metropolis, and having but seldom visited the locality in which we are now assembled, I have had but small opportunity of making the acquaintance of the gentlemen whom I now see before me. Notwithstanding, however, the disadvantage under which I am situated, I am anxious to bring before you a subject which is worthy the consideration of this, the first meeting of the session, a subject which I do not hesitate to call the most important one at the present time; one, the ultimate and definite settlement of which would do more to elevate the art of photographic portraiture than almost any other; one which is far from being understood, and still farther from being an active principle in the manipulation of every photographic portrait; and one which I believe to be the very foundation and basis of that peculiar excellence which, in the portraits of M. Adam-Salomon, took the world by surprise at the Paris Exhibition in 1867.

I do not at all pretend to say that in the present paper I am going, by any means, to do justice to the subject on hand; it is, I consider, a most difficult one, but it is, at the same time, one which requires much more attention than it receives; and it is one which, I hope, once started, will not be—as far too many subjects are—let drop, with scarcely any further expression of opinion on the matter than that of the author of the paper or article.

Let me now proceed with the matter on hand: the relation between intensity and tone. This, to a photographer of the present day, will doubtless mean the relation between the intensity of the negative and the tone of the resulting print. This is just the relation that I wish to speak of ultimately; but, before I do so, I wish to point out several things: I wish to show what seems to me a very beautiful series of facts, which lead up to the consideration of the present state of photography.

Intensity and tone are two very old words, although I apprehend that among photographers they mean generally two rather new things. We shall best understand my meaning if we consider at some length an example studied from nature. A calm summer sea, the gentle breeze only just stirring the waveless surface into ripples, the sun not setting, but yet so low as to be included in the picture, a few white sails glimmering in the far distance. Can you imagine any subject with much less contrast, with much less real intensity than this, one uniform glare of light, broken only by the greater glare of the sun's "path" on the water, and perhaps relieved only by the darker sides of the tiny ripples? Such a subject, if photographed, would probably not have to be made very intense in the negative, because there would be no gradation of colour to be obtained in the prints; white paper would not be bright enough to represent truly even the middle tint of such a picture; how much less the extreme light? From a picture of such a scene we could hardly gain any true idea of the brightness of sunlight, or of the real effect of light upon the ocean; the picture could have no intensity, and therefore it could have no real tone.

Now let us change the scene slightly. As the sun declines, the wind rises and scatters dark clouds along the horizon. See how at once the face of nature is changed! Now the horizon of the sea becomes dark like the clouds, and now,

too, the sun—before bright enough—becomes yet more brilliant by the contrast of dark clouds which rise towards it. See, too, how, in like manner, the sun's path upon the water is rendered more brilliant and marked by the darkening of the sea all round it, and how each tiny wave becomes darker on the side turned away from the light. Here would be more scope for the photographer or painter. Here would be more room to give some idea of the intensity of sunlight. The light would not be any more brilliant in itself, probably—indeed, it would be less so—but now we have some dark to contrast with the otherwise overpowering light, and contrast is the key-note and measure of intensity. Now we could get a somewhat more definite tone into our picture, which before we could not have done; and the reason why we can get tone in the present picture, and not in the first, is, that now we have a relation between the lights and darks of the picture, one which we can understand and appreciate, and can therefore represent.

Now let us again slightly change the scene we are considering. The tide has been falling, and now appears a line of dark, half-rotten timbers, once the main supports of some old breakwater; these, left bare by the falling tide, give us at once the true key-note to the whole composition. We know at once, from former experience, that the rotten wood of an old breakwater, with (perhaps) lots of seaweed growing on it, must be black, almost, if not quite; and so we have a guide by which to judge really *how* intense the sun's reflection in the water is, and *how* much darker the clouds are than the blue sky of the first picture. In the representation of this subject, either in a photograph or painting, we have the greatest range of contrast to be obtained in nature, viz., perfect black,* and the sun's disc, which is infinitely more than perfect white, in the same picture. We therefore have to use the greatest *intensity*, either in our colour or our monochrome, to produce the effect required. And what is the result in respect of the tone of the picture? The tone must now be from pure black to the purest white we can get.

There is a curious point to notice here, namely, that now we have an absolute key-note to the picture, we *must* have everything else in proper tone, or else it would be obviously wrong. Not so in the second picture which we considered; in that, by exaggerating the dark parts of the clouds, much more intensity might have been given; but now we have the black of the old breakwater piers to attend to, we are bound not to make the sky too dark, or else it would be out of proportion in colour to the rest.

Now, from what we have already advanced, I wish to gather these points: first, that the intensity of a picture is greater, just in proportion as its contrast between light and shade is greater; secondly, that the tone of a picture must always be governed by some one known and definite key-note, as the extreme black of the breakwater; and I think it will be seen, upon a little reflection, that the relation of every tone in the picture to white will change just in proportion to the intensity of black in the darkest part. When we did not know anything about the black of the breakwater piers, we should have thought the clouds were very much darker than they really were; but as soon as we saw how tremendously dark real black was, the clouds became quite light again, and all the picture seemed in harmony.

(To be continued.)

SOME REMARKS ON STEREOSCOPES.

BY VALENTINE BLANCHARD.†

I MUST claim your indulgence this evening whilst I offer some remarks on a subject which, I fear, many of you will regard as done to death and completely out of date. I hope, however, that the time will not be entirely wasted; that

* By perfect black, here, I do not mean the black of black pigment, but that which results from the simple absence of light.

† Read before the South London Photographic Society, Oct. 8th, 1868.

* Read before the North London Photographic Association, Oct. 7th, 1868.

something, at least, will arise out of the discussion to make you feel that the evening has not been entirely spent in vain.

I have brought for your examination this evening a very ingenious stereoscope of American manufacture, and I think you will feel with me, when you look at it, that we have in the old-fashioned model only another instance of our peculiar conservatism. The stereoscope is an instrument which is specially suited to while away a leisure hour in the evening, when the gas is lighted; therefore we have gone on, year after year, improving and beautifying our original box model, forgetting or overlooking the fact that, to begin with, it was altogether wrong in principle, excepting for transparencies, which, by the way, could be seen equally well in the model before you. It is true that in the commonest form of stereoscope sold in England you have the light admitted all round; but in consequence of the absence of the divisional bar and the arrangement—only to be met with in the most expensive instruments—for the protection of the eyes from the light, a limited amount of pleasure only can be got from it.

It ought not to surprise us that we have gone on so long with the original box model, when we remember that it is so natural for us to hold fast to old impressions. For instance, in the first experiments on the application of steam to locomotion on land, some old coach bodies were fastened together on a truck, only to be afterwards slavishly copied in our old railway carriages, and to be seen much too frequently on our railway lines at the present moment. Again, I have no doubt that as it was necessary to protect the gas flame from strong currents of air, a common stable lantern served as a model for all our street lamps, for in no other way can I account for their offensive ugliness. I might go on repeating instances, all tending to show how fond we are of a well worn road, and that we do not mind a few cart ruts by the way, but it would lead me out of the right path, so I will return to the subject in hand.

When we remember that only a very few years ago the whole civilized world was taken by storm when the wonders of the stereoscope were revealed to them, it certainly is a matter for much surprise when we notice how comparatively indifferent the mass of even educated folks are to the claims of this really beautiful instrument. If you put a stereoscopic picture into the hands of many of your friends, and offer them at the same time the instrument, in order that they may enjoy it the more, you will find, only too frequently, that it will be declined with thanks. There must be some cause for all this, and I think it will be found in the fact that in the mass of instruments a considerable amount of fatigue to the eyes is experienced after a few minutes' examination of a number of stereoscopic slides by different makers. The distance from centre to centre varies so much in the slides that the eye is constantly strained; hence the number of people who never properly see a picture with true stereoscopic relief.

It will be found that in the ordinary common stereoscope, of (say) 6 inches focus, a picture should not have the objects in the two pictures more than $2\frac{1}{4}$ inches apart; and yet you will find that so great is the demand for large pictures on the part of the dealers and the public, that a great number of the slides now offered for sale will measure $3\frac{1}{2}$ inches at least. Now, in the ordinary instrument, such subjects cannot be seen without much fatigue to the eyes; but with an adjusting stereoscope the lengthening of the focus will at once make these pictures combine with comfort. Mr. England and others have complied with this demand for size, without sacrificing the beauty of the picture, by taking away a portion of subject where the pictures come together, and giving it to the extremities, so that whilst the pictures well fill the stereoscopic mount, the centres are not more than $2\frac{1}{2}$ apart, and not often so much.

The instrument before you combines so completely all the excellencies of all the most expensive instruments, and is, withal, so ingenious and inexpensive, that I felt it only

needed to be more thoroughly known to give a new impetus to a department of photography which has declined much during late years. I felt, therefore, I could not do better than bring it before a Society where its advantages would be at once seen, and its merits thoroughly discussed. The necessity for such an easily adjustable instrument will be seen when I tell you that a difference of five inches in the position of the slide is needed to make it perfectly seen by two of my friends. One of them, a gentleman in this room, requires the slide close up to the partition; whilst the other needs the slide to be placed at the very extremity of the bar. This will be found to be nearly six inches. Another friend, who has looked at hundreds of slides, has never seen one perfectly until now. I hope this instrument will be largely made by the dealers, and that, in consequence, the stereoscope will once more be a pet instrument in the hand of every one.

NOTES ON PHOTOGRAPHIC SUBJECTS.

BY M. CAREY LEA.*

Poisoning by External Use of Cyanide of Potassium.—Although warnings have been so earnestly and so emphatically given as to the danger of the use of cyanide for removing silver stains, it continues to be used by many in preference to substitutes.†

Some time back a contemporary published a note from a correspondent, to the effect that his fingers had become swelled and sore, continuing so for months, and exuding a sticky substance, so that they adhered to his gloves. He mentions that he has made no use of cyanide except for cleaning his fingers, and attributes to that their present bad condition. This is a singular instance, brought into publicity by the sufferer desiring to find a remedy; but doubtless there are many suffering in the same way, who do not report themselves.

There is no recognized treatment for such troubles, nor have I had the opportunity of observing anything of the sort in person. But I would strongly recommend the trial of the following treatment, which I believe would be beneficial, and which, at any rate, could not prove prejudicial.

Take an ounce of oxide of zinc, and an equal quantity of starch, and a drachm of camphor. Pulverize the camphor by dissolving it in alcohol, and precipitating with water. Dry it, and mix it well with the other ingredients. Rub the powder well into the hands two or three times a day, brushing off the excess. I suggest this remedy as one which, judging by analogy, ought to be advantageous, and, as already remarked, it could do no harm.

It is not, by any means, necessary to use cyanide to get rid of silver stains. It is true that the other means hitherto suggested do not work well. Brushing the hands successively with iodine, nitric acid, and hyposulphite of soda is very troublesome and disagreeable, and, besides, very imperfect in its results. Chloride of iron, as recommended by Obernetter, I have not found to answer. But the remedy which I proposed some months since (bichromate of potash, 1 part; hydrochloric acid, 2 parts; water, 20 parts) I find very efficacious, and use it to the exclusion of all other means. At the end of the photographic work, wash the hands thoroughly with this. The stains disappear as rapidly as with cyanide. The solution leaves yellowish marks, and a peculiar smell upon the hands, both of which are got rid of with a little solution of hyposulphite of soda.

If I return to the subject of this treatment, after having already called attention to it, it is from a profound conviction of the necessity of banishing the detestable cyanide, as far as possible, from the photographic laboratory. The

* *Philadelphia Photographer.*

† A late number of a German journal comments upon a species of soap offered to photographers for the removal of silver stains, and remarks that the assertion in the advertisement that it was free from cyanide was confirmed by analysis, which also showed that the principal agent contained in it for acting upon the stains was powdered pumice-stone. It was said to be efficacious.

scientific chemist goes through a long education in a laboratory, where part of his education consists in being taught to handle poisons; and yet most chemists injure themselves in this way. One of the most celebrated of living chemists is said now to suffer greatly from the effects of exposing himself to injurious agencies, and to be in the habit of warning his pupils to profit by his experience. And I need not mention the names of Hennel, of Gehlen, of Bullacke, of Stevens, and other regularly educated chemists, who have lost their lives from imprudences of this sort. If these results take place with men who have had all the advantages of a special education, and a thorough acquaintance with the properties of the substances with which they have to deal, how much more must it be so with photographers, who often take up the pursuit without any previous instruction at all, or, at best, a brief course with some practical operator!

Is it not, then, reasonable to ask every one who is in the habit of using cyanide, to discontinue it, at least until he has given a fair trial to the above described substitute?

Negatives Losing Greatly in the Fixing.—Every one must have remarked that even when using the same chemicals, negatives seem, at some times, to lose a good deal more than at others in fixing. The difference appears to depend upon the following considerations:—

When a collodion film, charged in the usual way with bromides and iodides, is plunged into the negative bath, there is a formation of iodide and bromide of silver. But exactly where this transformation occurs will depend entirely upon circumstances. It is evident that either the nitrate of silver solution may enter the film and form the new silver salts in the film, or the bromides and iodides in the collodion may pass outside the film and meet the silver solution outside the film, in which case the sensitive layer of iodide and bromide of silver will be formed on the film instead of in it. Of course, a superficial deposit of the sensitive film will lead to the production of a superficial picture, and this cannot but suffer much more in the fixing than one firmly embedded in the collodion film. This naturally leads us to inquire under what circumstances the sensitive layer will be formed in the film, and, under what, upon it. The answer is not difficult to find.

The weaker the silver solution, the more rapidly will those portions immediately in contact with the film become exhausted of their silver by the decomposition at its very commencement. Then the production of the iodide and bromide is checked, and time is given for a portion of the iodides and bromides of the film to pass outside of it, and suffer decomposition beyond it. On the other hand, when the bath solution is strong, silver is supplied as fast, or nearly so, as it is exhausted, the sensitive layer is well imprisoned in the collodion film, and there results a negative that bears fixing with very moderate loss of strength.

It is evident from this, that inattention to keeping up the negative bath to its proper strength may lead to a consequence that might be mistaken for the result of something very different.

In a late number of the *Berlin Archiv*, Haugk mentions a case where this weakening of the negative to excess, in the fixing, took place with an entirely new bath. Although it seemed at first as if this could not be attributable to weakness of the bath, it proved to be so; the nitrate of silver had been largely adulterated with nitrate of potash, so that its strength was greatly inferior to what it had been supposed to be. The same bath, after having been much reduced by evaporation, gave negatives which behaved satisfactorily in the fixing bath.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The first meeting of the winter session of this Society was held in Myddelton Hall on the evening of Wednesday, October 7th, Mr. G. WHARTON SIMPSON in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were duly elected members of the Society:—Messrs. W. Wool, J. Crasweller, J. H. Shanks, J. Howden, G. Fuller, R. Chappell, Jun., F. Campion, S. Lowry, N. K. Cherrill.

The CHAIRMAN then called the attention of members to the presentation prints for the year, examples of which were on the table, which far exceeded in value the amount of the year's subscription. As the members were aware, on this occasion competition for the supply of the presentation prints was invited, and a large number of pictures were sent for selection. Of these, two had been chosen from the works of very able men, and were now ready for distribution. They consisted of a fine 12 by 10 print by Mr. Lake Price, entitled the "Falconer," which was very admirable as an example of art photography; of a 10 by 12 landscape by Mr. Nelson K. Cherrill, the subject of which was "Rusthall Common," near Tunbridge Wells. This landscape contained some of the finest cloud effects ever produced by photography, and the Chairman had pleasure in informing members that the selection of their committee had in this case met with the endorsement of a jury in Falmouth, as for this print Mr. Cherrill received the first silver medal of the Royal Cornwall Polytechnic Society. In addition to these were two whole-plate pictures, selected from Mr. Rejlander's charming studies, and printed by Mr. Woodbury's process. They were entitled "A Night in Town" and "Six Times for a Halfpenny." He had pleasure in congratulating members on the unusual number and value of the presentation prints the Committee had been able to offer them on this occasion.

Mr. BELTON exhibited a curious little camera and lens, the exact use or purpose of which he could not explain, but it had been placed in his hands as a curiosity, and might have some interest for the Society.

Mr. NELSON K. CHERILL then read his paper on the Relation between Intensity and Tono (see p. 499).

The CHAIRMAN, after proposing a vote of thanks to Mr. Cherrill, remarked that his paper contained so much that none of them would be disposed to gainsay, that he was afraid it would not excite much discussion. Mr. Cherrill had thought out and given definite expression to many things with which they were all familiar by practice, but which few of them had even mentally attempted to reduce to rule. There were, however, some of the practical points raised in the paper which it might be interesting to discuss. For instance, the question might arise: Would the possession of a standard quality of albuminized paper, to which Mr. Cherrill had referred as desirable, be really a good thing? Seeing that with the utmost care and accuracy in operating it would be difficult if not impossible to produce negatives of a standard intensity, might it not be regarded as an absolute boon to photographers that different kinds and qualities of albuminized paper were in the market, by familiarizing himself with which, and intensifying them, the photographer had facility of getting something like uniform results, by compensating want of absolute uniformity in his negatives by the use of papers of varied qualities? This and some other practical points might, he thought, be discussed with advantage.

Mr. HART thought, with the Chairman, that the existence of varieties in quality in paper was often an advantage. Until photographers had agreed amongst themselves as to a standard quality of negative, it would be difficult for albuminizers to satisfy them with a standard or uniform paper.

Mr. CHERILL said it was not uniformity at which he aimed, but that when he purchased paper it should bear some recognized relations to a recognized standard, so that every fresh batch should not require a certain amount of experiment before the photographer knew how to deal with it so as to secure good results.

Mr. HILL said that albuminizers might at least state what proportion of salt was used in preparing the paper, so that an idea might be formed of the strength of silver bath required.

Mr. HART said he feared that this would be of little service to the mass of photographers, as they took little note of the strength of their baths, generally keeping them in use until the albumen being dissolved indicated the need of strengthening.

A conversation on this subject followed, in which several members thought the information as to the salting would be useful.

Mr. HART said, from his experience, he did not think that the majority of photographers would pay any attention to it.

Mr. CHERRILL said that in their operations it would undoubtedly be useful, both as suggestive of the strength of bath necessary, and of the gradual reduction in the strength which would probably take place when a given quantity of paper containing a certain amount of salt had been floated on the bath.

Mr. BLANCHARD held the same view. It would save much waste of time and material if the paper were marked. Every time a new kind was employed, it was necessary to ascertain by experiment the kind of bath it required. He preferred weakly salted papers as a rule. He believed, that in order to get the best results in printing, exposure for sufficient time, independent of mere depth of printing, was an important thing. For instance, a thin negative with a highly salted paper might print deep enough in a very short time; but he did not believe the print would be so good or so permanent as if it had been printed on a paper more weakly salted, which would have rendered necessary longer exposure.

Mr. HART suggested that when photographers were anxious to ascertain the amount of the salt used they could soak the albumen and salt off a quarter of a sheet of paper by means of distilled water, and, by throwing down the silver by means of a standard solution of chloride of sodium, ascertain accurately.

Mr. HILL thought that was like using a steam engine to draw a cork.

Mr. BLANCHARD mentioned the fact that a weak bath would dissolve the albumen off a highly salted paper, but not off a weakly salted paper.

Mr. HART said that the larger the quantity of salt the less readily the albumen coagulated, and hence a strong bath was necessary to coagulate highly salted albumen.

Mr. BELTON agreed with the remarks of Mr. Blanchard as to the advantage of knowing something of the proportion of salt used in the albumen, and scarcely thought that because some photographers would not make good use of the knowledge, that those to whom it would be most useful should be deprived of it.

After some further conversation, in which Messrs. Hart, Blanchard, Belton, Hill, Shave, and Cherrill took part,

The CHAIRMAN said that the opinion seemed general that it would be a boon to photographers if albuminizers would afford them some idea of the proportion of salt used. It would be difficult for many reasons, even if desirable, to secure an absolute standard, and difficult to state accurately the proportion of salt employed. The varieties in the quality and condition of the original papers, a thing beyond the control of the albuminizers, would militate against uniformity. Some papers would absorb salt in greater relation to albumen than others, the degree of concentration of the albumen solution would affect the question, so that if the albuminizer started with a batch of albumen with a given proportion of salt, it would, from evaporation and other causes, have a different proportion before it was used up. Still, if albuminizers would make, say, two kinds of paper, distinguished as weakly and strongly salted, the first containing, say, between 5 to 8 grains to the ounce, and the strongly salted two or three times that amount, he thought photographers would regard this as a great advantage.

After some further conversation the proceedings terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The first meeting of the session of this Society was held in the City of London College, on the evening of Thursday, October 8, the Rev. F. F. STATHAM in the chair.

The minutes of a preceding meeting having been read and confirmed,

The CHAIRMAN called attention to the remaining presentation print of the year, which was now ready for distribution. It consisted of a magnificent 16 by 12 figure subject, by Mr. H. P. Robinson, entitled "On the Way to Market," printed in carbon by Mr. Swan's process. He considered the picture far exceeded in value the amount of the subscription, and, but for the kind moderation of the artist, they could not supply the members with a second print of such great value.

Mr. WHARTON SIMPSON exhibited some examples of Mr. Burgess's Eburneum process, and briefly explained some details regarding them.

Mr. BLANCHARD then brought before the members an interesting communication on Stereoscopes (see p. 499). He exhibited some examples of the new form of stereoscope, which he described and advocated, and expressed his conviction that the introduction of a cheap and convenient stereoscope would do much to revive the comparatively flagging taste for stereoscopic pictures. Mr. Blanchard also exhibited some charming slides for use in the instruments he passed round.

Mr. BOCKETT also exhibited an old cheap stereoscope, which he had modified so as to resemble the American instrument Mr. Blanchard exhibited.

A desultory but interesting conversation on stereoscopes and binocular vision, the form of instruments, lenses, prisms, &c. followed, after which the proceedings terminated.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Tuesday evening, the 26th ult., the President, the Rev. G. J. BANNER, in the chair.

Mr. FORREST passed round a specimen of his new glass for focussing, and several gentlemen who had used it pronounced it to be the best focussing surface they had seen. Mr. Forrest thought it would be particularly useful in microscopic enlarging.

Mr. HENDERSON reverted to Mr. Hughes's plan, described at a previous meeting, of focussing on white cardboard when enlarging.

A number of pictures, taken on the occasion of the last excursion to the "Old Hunt," were passed round. Amongst them a 12 by 10 print, by Mr. Hubbuck, from a dry plate twelve months' old.

Mr. WILSON produced a picture taken at a previous outdoor meeting, upon a plate two years' old.

The PRESIDENT complained of the bad results he had obtained lately with a new sample of paper, and asked if other members had tried it with a like result.

Mr. GREEN found fault with it for lack of brilliance.

Mr. HENDERSON said he had found that the time of year had considerable effect upon the quality of prints, and that from certain negatives he could not now produce as good prints as he had obtained during the spring and summer.

Mr. GREEN said the same remarks were applicable to fine and dull weather, and, also, that a greater degree of overprinting was necessary in a weak light than a strong. He accounted for it by supposing that with a strong light the image sinks deeper into the paper than with a weak.

A number of pictures by M. Constant-Delessort, of Lausanne, were examined with great interest. They consisted of pictures by the collodio-bromide process with various preservatives. Amongst the number was one of Lausanne Cathedral, which had received the same exposure as the wet process.

A communication was read from Mr. Sayce, thanking the Society and Mr. Green for the picture presented to him.

Mr. WILSON took exception to a remark that no progress had been made in the collodio-bromide process since its first publication. Mr. Wilson called attention to a new source of failure in dry plates. Having been troubled with patches of insensitiveness in the centre of some of his plates, he at last discovered that it arose from his having marked upon the backing of the plate with a wet rag after exposure a distinguishing number, and that when returned to the plate-box the close proximity of the moist back to the front of the next plate had set up an injurious action, resulting in local insensitiveness.

Amongst the objects exhibited were a new panoramic stereoscope and slides by Warner, kindly lent by Mr. Guyton, and a pocket camera and stand by Mr. Hubbuck.

The meeting was adjourned until the 27th inst., when a series of papers will be commenced upon the collodio-bromide process. Several gentlemen have promised to take up the different branches of the subject.

Correspondence.

PUBLISHING PRINTS FROM PURCHASED NEGATIVES.

DEAR SIR,—Have you room for the following question in the form of a warning?

If one sell a business with all pecuniary advantages desirable from the negatives, &c., does that confer the right to publish from such negatives as if they had been made by the purchaser himself?

My reason for asking is, that my successor is now publishing portraits of many eminent persons, all from negatives taken by me, with his name in full as the artist. I know such cannot be morally done; if it can do done legally, it is well the profession should know it, as in such cases they will know how to act in the sale.—I am, sir, yours truly, JOHN BEATTIE.

13, Buckingham Vale, Clifton, October 12th, 1868.

[The legal question could only be definitely settled in a court of law or equity, most probably the latter. We believe, however, that the practice commonly obtains to which you refer, and is not always as the result of dishonest intention, but because the photographer conceives that in purchasing the goodwill of a business he has a claim to all reputation, &c., attaching to it; and he further mounts the prints from the negatives he has purchased on cards with his own name and address as a matter of course. Perhaps the point you raise ought to be made matter of specific agreement at the time of transfer.—ED.]

Talk in the Studio.

PRIZE PORTRAITS AT THE ROYAL CORNWALL POLYTECHNIC EXHIBITION.—We have been favoured by Mr. Netterville Briggs, of Leamington, with a copy of the portrait for which he received a silver medal at the exhibition now open in Falmouth. The photograph is in size 12 inches by 10 inches, and may be described, in general terms, as similar in treatment to the portraits by M. Adam-Salomon, and is a noble example of a grand and effective style. It is a portrait of a gentleman, easy and graceful in pose, rich and deep in the shadows, pure and delicate in the lights, with admirable half-tone and modelling. In the interesting report of our Falmouth correspondent allusion was made to a roll of paper in the hand as slightly disturbing the repose. In the copy before us the roll in question, being low in tone, rather serves to spread and repeat the lights, and gives value to the picture. The definition throughout is sufficient without being too sharp, the texture of the flesh being very fine. The composition and chiaroscuro are satisfactory, and the whole picture effective. We are glad to see Mr. Robinson's successor at Leamington so worthily taking a position amongst first-class portraitists.

INTENSIFYING VARNISHED NEGATIVES.—Some years ago we described to our readers our method of intensifying varnished negatives by means of an alcoholic solution of iodine. Mr. Kjellander informs us that he has recently been treating some of his old negatives, which were a little wanting in vigour, by this method with the most satisfactory results, the prints obtained from such negatives being much superior to any they had yielded before. Photographers who have not tried this method should experiment with worthless negatives, in order to familiarise themselves with the manipulations, as much of success depends in stopping the operation at the right point.

PHOTOGRAPHS ON GRAVESTONES.—The custom of placing photographic portraits of deceased persons on their gravestones is gradually becoming customary in some parts of the country. They require, of course, to be placed under glass, and carefully sealed up to preserve them from the influences of weather. We notice, in a provincial paper, that two such portraits have recently been placed in a cemetery in a town in the north. When enamel portraits become a little more accessible and popular they will doubtless be found most suitable for such a purpose.

PHOTOGRAPHY IN CHURCH.—We have received from a correspondent a copy of the *Newcastle Daily Chronicle* of last Wednesday, which contains the following letter:—"Photography in the Church.—Sir,—On Saturday last, a wedding (probably a fashionable one) took place at the church of St. Saviour's, Tynemouth. After the ceremony was over, the vicar (the Rev. T. Featherstone) from within the altar rails requested the congregation and the bridal party to remain still for a few minutes. Guess, Mr. Editor, the object! Oh, hor-

rible to relate! it was to enable a photographer to take the portraits of the bridal party and the vicar with his robes on. Has the vicar forgot the robuko given by our Saviour to those who sold and bought in the Temple, when He overthrew the tables and the money changers, and the seats of them that sold doves, and said unto them, 'It is written, My house shall be called the house of prayer, but ye have made it a den of thieves'?—I am, &c., Edwin, Tynemouth." The photographer, we know, is almost ubiquitous, and very pertinacious. He cannot well be blamed for exercising his craft wherever it is possible. It is no part of our duty to enact the ecclesiastical censor, otherwise we should certainly regard the action of the vicar as open to grave rebuke for making the church a studio in which to photograph a bridal party.

WEAK BATHS.—Describing the operations in producing the very fine illustration to the October number of the *Philadelphia Photographer*, by Mr. Koeler, of Philadelphia, the *Photographer* says:—"It was printed during the whole summer upon an average solution of eighteen grains. Sometimes I used as low as thirteen grains. My formula is about as follows:—

Silver	480 grains
Water	24 ounces
Alcohol	1 ounce.

Fleet the paper one minute, fume five minutes. This paper kept white through the hot weather; more so than any paper I have used.

TONING SOLUTION.

Water	32 ounces
Acetate of soda	60 grains
Table salt	60 "

Take one bottle of gold containing fifteen grains, and dissolve in eight ounces of water. Take one ounce of chloride of gold solution and neutralize with bicarbonate of soda, and add to the above, one hour previous to using it. This bath may be used an indefinite number of times by adding the above amount of gold each time."

PHOTOGRAPHIC IDENTITY.—In New York it is announced that the directors of the Park Bank, in establishing regulations for their new safe-deposit vaults, have adopted the idea of identifying each lessee of a safe by his own carte-do-visito previously obtained.—*Philadelphia Photographer*.

EARTHQUAKES AND PHOTOGRAPHY.—It is stated that in America the price of gun-cotton is about to be advanced, for the reason that the earthquake in South America has cut off the supply of nitrate of potash.

"SCIENTIFIC OPINION."—A new series of this journal, the publication of which had been suspended, is announced for issue next month by Messrs. Wyman and Sons. It will contain a general *resumé* of the progress of current science, and, as such, will be interesting to many of our readers.

To Correspondents.

TYRO.—If you have access to the *Edinburgh Philosophical Journal* for 1819, you will find Sir John Herschel's very full account of the hyposulphites, and the first intimation of their value in dissolving salts of silver. Three forms of hyposulphite of silver are there given: First, $\text{Ag O, S}_2 \text{O}_3$, a salt very sparingly soluble in water, but soluble in a strong solution of any alkaline hyposulphite. Second, $\text{Ag O, S}_2 \text{O}_2$; $\text{Na O, S}_2 \text{O}_2 + 2\text{H O}$, sparingly soluble in water, but soluble in a strong solution of an alkaline hyposulphite. This is the salt commonly formed in cases of imperfect fixation from the use of a weak or exhausted fixing bath or imperfect immersion. Third, $\text{Ag O, S}_2 \text{O}_3$; $2\text{Na O, S}_2 \text{O}_2 + 2\text{H O}$. This salt is readily soluble in water, and is the salt which should be formed in the ordinary process of fixation. It is upon the conversion of the chloride of silver, which is insoluble in water, into a hyposulphite of silver, which is soluble in water, that the process of fixing depends: for whilst much of the silver is dissolved out of the print in the hypo bath, if the silver salt which always remains in the print on leaving the bath were not soluble in water, we could have no perfect fixation or approach to permanency. You will find an account of the hyposulphites of silver and their behaviour in Hardwich's Manual, p. 168 of the last edition, or

p. 57 in the sixth edition. It is our practice in writing for non-chemical readers to deal with a subject as popularly as possible, avoiding technical terminology and the use of symbolical formulae. Ignorance is pardonable where it is modest and confessed. It only becomes very contemptible when it is paraded and exulted in.

OXONIENSIS.—In double printing there is constant necessity for the exercise of personal judgment and ingenuity, and these will grow with practice. There are often several modes of doing the same thing, but there are also certain recognized methods which are most simple and effective. In a landscape with a soft, tender distance forming the sky-line, it is a good plan to practically vignette the mask which covers the sky into the landscape by means of a little cotton wool. Where a spire, or a series of pinnacles, or similar objects cut sharp against the sky, if it be necessary to mask the sky, there is no better plan than painting on the varnished surface of the negative with lampblack or other suitable water colour, or black varnish, carefully following the outline of the object. An ordinary roughly cut mask is then used, which does not come quite close to the spire, &c., but overlaps the painted portion. 2. Sunning down a sky, so as to produce a graduated tint, may be done in several ways after the print has left the pressure-frame. A piece of board may be used to shade it, gradually uncovering in the degree required; or, the landscape portion being quite covered, a cylindrical roll of paper may be placed upon the sky in such a position that it partially protects the paper, and just allows sufficient light to produce a graduated tint to fall on the white sky. Where a spire or similar object projects into the sky, it may be disregarded in the process of sunning down; in this way the slightly increased depth of the top portion will not be apparent in the finished picture. 3. It is probable that large prints will be injured in a small syphon tub. The principle of such machines is very good, but it should be applied in vessels of suitable size for the prints. The plan of Mr. England's machine is a good one for large prints. We described it a few months ago. There are several good washing machines to be bought; but there is nothing superior to constant change and draining by hand for those who only require a few prints, and take a personal interest in their excellence. 4. Baths often rapidly discolour again after the use of kaolin, because they are often made slightly alkaline by some impurity in the kaolin. There is no serious harm in using a discoloured bath, so long as the tint acquired by the paper is removed by the hypo bath, which it commonly is. We prefer decolorizing the bath by the addition, with agitation, of a few drops of a strong solution of common salt, which, in forming a precipitate of chloride of silver, carries down colour and other contaminations. The use of one-eighth of alcohol in place of water in the nitrate bath often checks discolouration.

J. CARTER BROWNE, M.A.—We are glad that you got rid of your troubles by returning to your old process. We fear that there is no developer which will give tones similar to those of Ferrier's transparencies on tannin or tannin and sugar plates. Gallic acid would not help you. The ordinary pyro and citric acid developer generally gives very good tones; but you may possibly get a colour more approaching to black by the use of tartaric acid in place of nitric acid. 2. The soft, somewhat hazily-defined effect of the print to which you refer is not in any way due to the printing process, but entirely to the negative, which was probably purposely taken a little out of focus. 3. As almost any pigment you may choose may be employed in the tissue in Swan's process, there can be no great difficulty in obtaining a suitable green to give the tint of foliage, if you wish it. Such a colour could only be used, of course, in close bits, in which no sky is seen, as nothing would be more hideous than a tint of green in the sky. You might produce the tint by the addition of some of the green pigments sold by artists' colourmen, such as sap green, emerald green, malachite green, &c., or by the mixture of a blue and yellow pigment. 4. We should be glad to have a fuller description, for publication, of your printing-frame for transparencies.

W. J. A. G.—Mr. Gordon prefers the iron development for his gum plates, as giving the best results and securing immunity from some troubles. The details of iron development were given by Mr. Gordon in our number for May 15th, p. 230 of the present volume.

W. S.—Mr. Solomon, of Red Lion Square, is the agent for the sale of Harnecker's dry collodion in this country.

QUANDARY.—The term plain paper is used simply as a distinction from glazed or albuminized paper, and, for transferring collodion prints to any good smooth plain paper, whether photographic paper or not, will serve. The only advantage of using photographic paper is derived from the fact that it is of a more even, perfect texture generally than ordinary writing papers. 2. The glazed or enamelled papers for the purpose are prepared in France, but are, we believe, sold by most London dealers. We do not know the price. If we remember aright, we have seen it for sale at Mr. Hughes's, in Oxford Street. 3. If albuminized paper be employed, it would not be necessary to gelatinize it, probably, but it would be necessary to have it without salt, which commercial samples are not; so you had better abandon the notion of using albuminized

paper. 4. In referring to the dry method of transferring, we said the manipulations were similar to those used in enamelling, because we had often described the process. You will find details in our YEAR-BOOK for 1865, page 82. We may briefly state the plan thus: when the transparent print is toned and dried, coat it with a warm solution of gelatine, 1 ounce in 12 ounces of water. When this is set, moisten the paper for transfer, and bring it into contact with the gelatinized paper. When dry, a knife point is run round the edge, and the whole leaves the glass. We prefer the wet transfer as simpler and requiring less delay, and as also giving a little less gloss, which we prefer. 5. Yes; the gelatinized paper should be moistened with cold water.

A. CONSTANT READER OF THE NEWS.—Both the lenses you name are very excellent, but we prefer that you distinguish as A.

B. L.—A transparent trick, very common in the quarter you name, which we understood before we received your letter. Thanks.

YOUNG AMATEUR.—In Mr. Bartholomew's acetate of morphia process the plate is not washed after treating with the 1-grain morphia solution, but is simply drained and dried. 2. In Mr. Gordon's gum process, the gum and sugar-candy solution is not washed off; the plate is simply drained after its application, and dried. 3. The choice must depend much on circumstances. The first is simplest, but it should only be used for plates to be used within a few days. Plates by the latter will keep for months. 4. All good bromo-iodized collodions answer well. That you mention (Rouch's) will, we believe, be found suitable. 5. A good developer for collodion positives on glass stands as follows: proto-sulphate of iron 15 grains, nitric acid 2 drops, glacial acetic acid 15 drops, water 1 ounce, alcohol *quantum suff.* 6. Dry plates are not well suited for the production of positives, but it is possible to produce tolerable results upon them.

JAMES KERR.—You will find an article describing several methods of employing two prints to form one picture on page 544 of the Eighth Volume of the PHOTOGRAPHIC NEWS, the number being that for November 11th, 1861. The process, with slight modifications, has been repeatedly patented, but we do not think that any of the patents are in force.

ACTINIC (Jersey).—The design and general proportions of your proposed studio are excellent. The only modification we would suggest is the extension, if convenient, of the side light on the north side to ten feet.

E. SAWYER.—We hope you will receive sufficient information to enable us to rectify the matter satisfactorily in our next. We will bear your request in mind.

GUM GALIC AMATEUR.—Your communication arrived just as we were going to press, but shall have attention in our next. Although the handwriting and crest make our correspondent known to us, he should have enclosed his card in a letter making such an offer.

RECEIVED: A series of Micro-photographs from the Surgeon-General of the United States army; the Quarterly Journal of the Quekett Microscopical Club; and a Portrait from Netterville Briggs. Communications from E. L. Wilson (Philadelphia), Diogenes, Major M. (Rajampore), and several other Correspondents.

* * An Article on the Late Eclipse, "Visits to Noteworthy Studios," an Article from Mr. Boyce, some Reviews, and several other Articles in type, are compelled to stand over from the pressure on our pages.

Several Correspondents in our next.

Photographs Registered.

MR. C. MURRAY, London.
Six Photographs of Robert E. Gay, Esq., M.R.C.S., &c.

MR. J. STEART, Glasgow.
Photograph of David Macrae, Esq.

MESSRS. BEAUFORD & BROS., Nuns Island, Galway.
Photograph of the late Father P. Daly.

MR. J. COLLINGS, Cardiff.
Ten Photographs of Ball-room and Cardiff Castle.

MESSRS. W. & D. DOWNEY, Newcastle.
One Photograph of Her Majesty the Queen.
Three Photographs of H.R.H. the Duke of Edinburgh.
One Photograph of Prince and Princess of Wales and Family.
Three Photographs of Right Hon. B. Disraeli.
One Photograph of Dr. Norman McLeod.

MR. H. BIRLON, Bradford.
Photograph of Mr. Chippendale.

* * All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 529.—October 23, 1868.

CONTENTS.

PAGE	PAGE
A New Aid to Harmonious Printing	505
A Photographers' Relief Fund	505
The Proportion of Salt Employed in Albuminizing Paper	507
Failure of Photographing the Eclipse in India	507
Uneven Drying of Sensitized Albuminized Paper	509
On the Application of the Camera-Obseura to Harbour Defence	510
Modes of Lighting the Sitter. By John Beattie	510
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	511
Print-Washing Aided by Osmotic Action. By W. J. Land	511
On the Relation Between Intensity and Tone. By Nelson K. Cherrill	512
To Swing, to Tilt, or to Level? By Prof. John Towler, M.D.	513
Correspondence—Cleaning Old Plates—Amount of Salt Used in Albuminizing Paper—Distortions and Perspective	514
Talk in the Studio	515
To Correspondents	515
Photographs Registered	516

A NEW AID TO HARMONIOUS PRINTING.

The importance of skill, taste, and judgment in printing, especially in portraiture, is, we believe, but imperfectly appreciated amongst many photographers. To print a negative fairly, so as to do full justice to its good qualities, as well as its defects, without suppressing or exaggerating either, is not such a mechanical task as some imagine. To get all in the print which is in the negative is one element of good printing, but it is by no means all that is required, nor all that is possible for the printer of artistic taste and skill to secure. By the exercise of a little judgment contrast may be decreased or increased, defects modified or suppressed, shadows deepened, and spotty lights toned down or removed. In short, by skill on the part of the printer, a good picture may be produced from an indifferent negative.

Mr. Samuel Fry has just communicated to us an important aid to artistic and harmonious printing which he has for some months past employed with very great success. It depends on a system of masking in which he has most ingeniously employed existing means to a most important end. Let us, before proceeding further, explain the circumstances under which this aid becomes of special value.

Every photographer is familiar with a class of negatives in which there is a slight excess of density. All the detail and modelling are there, but from the unexpectedly non-actinic colour of the deposit when dry, or from the temptation, so strong to some operators who love brilliancy, to give just a moment too long to the intensifying, the lights are slightly too opaque. The consequence is, that the shadows are bronzed before the modelling, due to delicate half-lights, is sufficiently impressed on the sensitive paper, and, if the portrait be printed sufficiently deep to do this modelling justice, all detail in the shadows is buried, and blackness and want of transparency is the result. The use, in printing, of paper and bath giving little contrast, sun printing, and shading the deeper parts of the image during the progress of printing, are remedies each of which affords some advantage in such cases; but the expedient we are about to describe is simpler and more efficient in many cases than any of them.

The mask Mr. Fry employs is a transparency from the same negative. It will be seen in a moment how this operates. The transparency or glass positive is in all respects the reverse of the negative. Where the latter is opaque, the former is transparent; where the negative is transparent, the positive is opaque. When the paper print from an over-dense negative is sufficiently printed in the shadows, the lights still remaining chalky and without detail, the transparent positive on glass is brought into use. It is placed outside the printing-frame, of course, because the print could not with advantage be disturbed, and because extreme sharpness in the printing of the mask is not required. It

will be seen now that the deposit forming the shadows of the transparent positive protects the print in those parts which are already sufficiently deeply printed, whilst the whites, being transparent, permit the rays of light to pass freely, and so to continue to print through the dense lights of the negative, and thus to secure in the proof all the delicate detail in the lighter portions of the picture without losing transparency, burying detail in the shadows.

It will be seen that this kind of mask suits itself to the precise degree in which the excess of contrasts exists in the negative, and must, if used with judgment, inevitably tend to produce harmonious prints from dense or hard negatives. Where special effects are required, such a mask may easily be manipulated a little. For instance, it may be necessary to preserve the extreme purity of some few points of light, whilst it is desirable to reduce, or get detail into, many others. In such a case it would be easy to stop out in the transparent positive the points where further printing in the lights is not desired. Modifications of this kind will doubtless suggest themselves to the judicious printer as the occasions arise.

In some instances, instead of taking a glass transparency, a paper print, made transparent by means of varnish or wax, might be employed as the mask; but it would not be so efficient, as the registration of gradation would not be so perfect, and the amount of light obstructed by such a paper mask would make the final harmonizing operation somewhat slow. As every new aid to artistic printing is of great value in securing the progress of portrait photography, photographers are indebted to Mr. Fry for an ingenious and useful method of obtaining harmonious prints from over-intense negatives.

A PHOTOGRAPHERS' RELIEF FUND.

We have received several letters of late on the subject of a photographers' relief fund, all of which, with some diversity of opinions on points of detail, agree in the general idea that "something ought to be done." Some few think that the time is not quite ripe for such an experiment; and that it would be a pity to try it and fail. This view was forcibly put to us by one of the oldest and ablest of our artistic photographers, who recently called upon us. He suggested that photography, as a profession, is undergoing a weeding process; that many who took it up hastily, because of the promises of profit it seemed to hold out a few years ago, but who did not, in a legitimate sense, belong to photography as a profession, were forsaking it again for their own respective legitimate callings; and that it would be better to get this weeding process completed before establishing any benefit fund, the existence of which might tempt them to remain longer in a profession which, for their own sakes, they had better abandon.

The question as to the proper class of persons to be admitted to the benefits of such an organization, although really a detail for subsequent decision, stands sufficiently in front of the question to merit some consideration at the outset, as it might materially determine the character of the organization. If a benefit society proper, upon an economic basis, be established, the wider and more catholic the qualifications of the members the better, for a benefit society works most perfectly when it consists of large numbers. The averages upon which the distribution of relief must be calculated work out more perfectly over a widespread area than they possibly can within any limited range. If, on the other hand, a benevolent fund be contemplated, it becomes important that relief designed for photographers should be preserved for them, and not poached upon by the quasi-claims of hangers-on of the profession. It is not necessary, at present, to define the qualifications which should entitle the possessor to inclusion in the benefits of any contemplated fund; but it may be worth while to bear in mind certain broad distinctions, such as we have hinted at, in any steps which may be taken in the matter.

In the meantime, as we have said, every one seems to be satisfied that it is desirable that something should be done. Indeed, ever since we first broached the idea, four years ago, this proposition has received general assent. But the important question, Who will undertake the practical initiation of the matter? remains still unanswered. Our immediate purpose in writing now is to place before photographers a very important offer which has been made. We have received a letter from a gentleman, whose handwriting we know—although no name is appended to his letter—as that of an amateur of high standing, offering, if a satisfactory committee be formed within six months, to contribute fifty pounds towards the formation of a fund. We print his letter without further preface, and shall then add one or two observations to correct certain misconceptions it contains:—

“THE PHOTOGRAPHIC PROVIDENT FUND.

“To the Editor of the PHOTOGRAPHIC NEWS.

“DEAR SIR, —I see by the various journals numerous letters respecting the late Goddard Fund, and also that there is an idea to create a new one to assist photographers generally. Some of these letters imply great blame with those who had the management of the former fund. I think it was a great error of the trustees to withhold the money from Mr. Goddard, seeing it was asked for in his name. No doubt they thought it would be for the best to make the money received the commencement of a fund for more general purposes, and so it has gone on until now.

“At the present time much good might be done by starting a Provident Society Fund, to be composed of those who may some day or other require help, and also those who are well off, and able, from their means, to assist those most deserving. The great end of such a fund should be to give assistance only to those who, when in health and earning good wages, had tried to make a saving against accident and misfortune as far as laid in their power, and those who had been overtaken by accident without having had that opportunity. It is very much the fashion for charitable institutions to give to all who ask, or to those who can put the most pressure on the subscribers, instead of making more enquiries as to the cases being deserving or not. These do much more harm than good, and serve as an encouragement to the improvident.

“Supposing these views meet the approval of many who are willing to help, and a fund is started, no doubt the balance remaining of the Goddard Fund would be handed over to the committee, and a start made in the right direction. If some one would act as secretary, to receive the subscriptions, the journals would most likely publish a full account of all done during each year, and every subscriber would know how the money was distributed.

“If these ideas can be carried out in the course of the

next six months, and a committee appointed to my satisfaction, I will commence with a donation of fifty pounds to the fund.—I remain, dear sir, yours truly,

“October 12th, 1868.”

“GUM GALLIC AMATEUR.”

Here is a noble offer, coupled with the simplest and most reasonable conditions. It will surely not be suffered to lapse without some effort to make it available. We may add that we have in our possession various other promises of liberal subscriptions, payable when such a fund shall be formed.

The errors or misunderstanding to which we alluded have reference to the Goddard Fund. It is no part of our duty to anticipate the report of the gentlemen under whose direction the fund has been administered; but as an agent through whom part—the larger part of that, indeed, sent through the journals—of the money was forwarded to the treasurer, and having so acquired a quasi-trusteeship, and, of course, a perfect knowledge of the facts, it would be unfair in us to print the above letter without correcting the misconceptions it contains. There are two points to mention:—

First. The fund was raised to relieve Mr. Goddard from a state of extreme indigence bordering on starvation, and the trustees, with a much fuller knowledge of the circumstances than we can here detail, administered the fund as they believe best secured the purpose for which the money was asked; and from the commencement of the subscription to the time of his death Mr. Goddard was provided for, and was in the receipt of relief from the fund averaging three or four times the amount of his previous income, derived from precarious charity. If the committee had agreed to part with the sum raised, instead of resolving to invest it in an annuity, they had reason to believe that, although it would have relieved them of immediate trouble and responsibility, they would have failed in securing the end for which they had appealed to the public. This is simply a question of judgment, in which the trustees, with a more minute knowledge of facts than would be easy to make public here, took the course involving the greater trouble, in order to keep faith with the contributors to the fund.

Second. The notion that the trustees have, or ever had, any intention of employing the Goddard Fund as the nucleus of a general fund is altogether an error. We know that statements to the effect that such an intention existed have been industriously circulated; such statements are pure fabrications, without a shadow of foundation in fact. When Mr. Goddard died, the end for which the money had been contributed had been achieved, and the balance of the money, after paying the liabilities and funeral expenses of Mr. Goddard, the trustees at once felt belonged, not to them, to dispose of as they chose, but to the subscribers, by whom it had been entrusted to them for a specific purpose; and they resolved to return the balance to the subscribers, dividing it in the ratio of the contributions. This would have been done at once, but certain claimants arose, alleging that the money had been bequeathed to them by Mr. Goddard. Although the claimants for money supposed to have belonged to Mr. Goddard at his death had left him to indigence in his life, it would have saved the trustees some trouble to have handed over the balance at once; but the view entertained by the trustees of the ownership of the money being confirmed by legal advice, they had no alternative but to restore the balance *pro rata* to the subscribers. As we have said, this would have been effected without delay, but those concerned in Mr. Goddard's will having signified their intention to contest the ownership of the money at law, the trustees were instructed that no steps should be taken to redistribute the money until the lapse of a sufficient period of time. This done, it was necessary to collect as perfect a list as possible of subscribers, with their addresses, a work of no little time and labour, already, so far as we believe, nearly accomplished. Every subscriber to the fund sufficiently interested in the matter to make enquiry, has received full information of the facts, and in every instance has expressed unqualified

approval of the course taken by the committee, upon whom a troublesome and thankless task had fallen.

Under these circumstances the committee have not felt concerned to notice the false reports, raised for mischievous purposes, in sham letters, by unscrupulous men, who avoid the risk of detection and punishment by writing anonymously. That any one so high-minded and straightforward as the correspondent who makes the above munificent offer should for a moment be misled, is a temporary evil very readily rectified. Anonymous slanders cannot in any way injure the gentlemen against whom they are directed; but they may in some degree effect other mischief, by temporarily narrowing or retarding the stream of benevolence, and by rendering able—and therefore generally busy—men indisposed to subject themselves to false statements and offensive innuendoes by undertaking the onerous duty of initiating and managing such an organization.

Our correspondent will see, however, although at first glance it might seem desirable that the balance of a fund raised for a specific benevolent purpose should be applied to a benevolent project of similar aim, but wider scope, despite the injurious suggestions as to motive made by malignant persons, yet those to whom the funds were entrusted have no power to make such application. The money belongs to the subscribers, and is only held in trust until the proper moment arrives for returning it to its rightful owners.

THE PROPORTION OF SALT EMPLOYED IN ALBUMINIZING PAPER.

A QUESTION which "crops out" at intervals amongst photographers was raised at the last meeting of the North London Photographic Society, and is again referred to in our pages in the present number. The question is: Is it important that albuminizers should state what proportion of chloride is employed in conjunction with albumen in preparing photographic paper? The question is simple enough, and it might be imagined that no discussion whatever need arise on the subject, but that it would be answered without a moment's hesitation, whether the information were of value or not. But, oddly enough, the question is not answered: a circumstance which has induced some photographers to ask the question put by a correspondent in our columns this week: Is there some occult reason for this reticence? Is it possible that albuminizers work so much by rule of thumb that they are uncertain of the proportion of salt employed?

We do not think that any such reason for reticence exists, or that any reasons exist at all beyond a certain amount of indifference, and an impression that the information is not really required by the public. Mr. Hart stated at the North London meeting that few photographers had any interest in such information, or could make any use of it if they possessed it; and he suggested that those who were anxious to know the proportion of salt could easily dissolve the albumen and salt off a quarter of a sheet of paper, and, by precipitating the chloride by means of a standard solution of nitrate of silver, obtain means for estimating the proportion of salt present. In making this suggestion Mr. Hart overlooks the fact that, apart from the delicacy of the operation to persons non-familiar with chemical manipulations, it is the trouble to which they are put which is the ground of protest on the part of photographers. They complain that with a fresh sample of paper they have no guide to the mode of treatment required without some experiment; and, as a remedy, Mr. Hart suggests an experiment which, to many of them, will be far more troublesome.

We know Mr. Hart to be a skilful, intelligent, and conscientious manipulator, and that all his operations are based on sound chemical knowledge of his subject, and careful consideration of the wants of photographers, neither guesswork or chance governing his operations. We do not imagine for a moment that the operations of any albumin-

izer are conducted so loosely, or so much by rule of thumb, that he could not give a tolerably accurate statement of the proportion of salt used. From a variety of causes we need not dwell on, exact precision in the statement might not be easy, but a very near approximation might be given, quite sufficient for the purposes of photographers. Very few photographers now prepare their own paper: with all the uncertainties of which we occasionally hear complaint, it is found, as a rule, easier and better to buy albuminized paper ready for use than to prepare it at home. At a time, however, when photographers did albuminize for themselves, we remember that it was the custom of some of the most able men to prepare two distinct kinds—a heavily-salted paper for vigorous negatives, and a lightly salted paper for soft negatives. Why should not albuminized paper-makers do the same, and state that the strongly salted paper contains from 10 to 12 grains of (say) chloride of sodium to an ounce of albumen solution, and requires exciting on a 60 or 70-grain bath; and that the other contains 6 or 8 grains of the chloride, and requires a 30 or 40-grain bath? There could be no great difficulty in this; and the information would be acceptable to many, and might be useful to all.

Mr. Hart, plausibly enough, asks, Why photographers do not ask the constitution of the collodion? Two or three answers to the question arise at once. It might be first replied, that they have often done so, and the more intelligent of them would always be very glad to have some idea of what they are using. It might be replied, in the next place, that such information is often, at least in a modified form, supplied. Manufacturers generally willingly state whether a collodion is simply iodized or bromo-iodized, and also whether it contains an extra proportion of bromine. But the most important answer is found in the fact that variations in the proportion of salt in albuminized paper produce greater variations in result, less under the control of the photographer, than the slight variations which exist in commercial samples of collodion. In printing, very much of the quality of the picture as to vigour or weakness depends on the preparation of the paper, and the photographer has not much facility in modifying this, except so far as it can be done by altering the strength of the silver solution. With collodion the case is different; the control possible in the developing and intensifying operations renders the original tendency of the collodion of far less importance.

Mr. Hart said—and, we are satisfied, truly—that photographers could generally obtain the information by asking for it of the manufacturer. Would it not be well that it should always be given in general terms without asking, and that in future a 6-grain or a 10-grain paper be as familiarly spoken of as a *Rive* paper or a *Saxe*?

FAILURE OF PHOTOGRAPHING THE ECLIPSE IN INDIA.

It is a matter for deep regret and mortification that the photographic part of the operations of the Expedition sent out from England to India to observe the late solar eclipse was a comparative failure. Some weeks ago the members of the Royal Astronomical Society received copies of a letter sent by Major Tennant to the Astronomer-Royal, recording the results obtained at Guntoor on the 18th of August. The photographic portion of the report was so unsatisfactory, or even humiliating, that we felt little inclination to publish it. An extract secured from a second letter, although recording that the results were better than were at first believed, does not serve to redeem the operations from the stigma of comparative failure. The first letter of Major Tennant opens as follows:—

Guntoor, August 18, 1868.

This morning was very promising, and if it had followed the course of its predecessor, we should have had a magnificent clear sky; but it clouded over the east with thin cumulostrati, which, while hardly stopping vision, interfere very much with the photographic energy; and the result was that every negative was under

exposed, and we have little more than very dense marks showing the protuberances. The six plates arranged for were duly exposed, but the heat so concentrated the nitrate of silver solution, that, besides showing but faint traces of any corona, they are all covered with spots. Still we may make something of them, and will try.

Our first impulse, on reading such a statement as this as the result of such an expedition on such an occasion, was to repeat the famous sentence of Ruskin, "This is not failure, but disaster!" Compared with the results obtained by Mr. Warren de la Rue in Spain, in 1860; compared with those secured by the German expedition, and recorded in our pages by Dr. Vogel, such an issue as the above is most humiliating. The plates were under-exposed, and covered with spots, we are told, as though the possibility of guarding against such contingencies was a thing undreamt of. In a subsequent letter to Mr. Warren de la Rue, Major Tennant is more hopeful, and better satisfied with the results obtained. The extract from his letter, published in the *Athenæum*, is as follows:—

I did myself the pleasure of sending Mr. Airy a report, such as I could hurriedly make, upon the 18th, of what we had seen and done. Since then we have been enlarging the photographs, and I am very well satisfied. The clouds reduced the actinism very much and very unequally, but that has shown new things to me. 1st, there is very little corona; 2nd, the cloudy structure of prominences is very marked. But the most remarkable thing is a great horn, which seems to have been 3m. 20s. nearly high. I have, as I told Mr. Airy, clearly seen in its spectrum C D and b, and believe I saw F, but did not identify it. Now this shows, both in Nos. 1 and 3 [photographs], as a ribbon of light, coiled spirally round a semi-transparent centre. It is very beautiful, and marked in 3, which was taken two minutes after the [commencement of] totality, and I am doing my best to keep this feature [to retain this feature] in the copies. No. 1 was taken apparently before the last of the sun went. Phillips [one of his assistants] says it was, and there is a spot of fog such as would be the result. There is a fine line of light seen through all this fog, much brighter than the corona. This, too, I am keeping on enlarging. We have got six enlarged positives, about 2½ inches in diameter, from each negative. Every one of these shows the same remarkable spiral structure in the great horn. I find there are traces in a drawing which Dr. Janssen got made of that prominence [mentioned in the first part of his letters as invisible to the eye] of which I spoke. The positive copies I will enlarge to 9 inches.

The result of the under-exposure, it is here suggested, was less injurious than was at first suspected; but the multitude of spots, from the nitrate of silver becoming "concentrated," of course nothing can remove, and their presence must seriously interfere with the value of the photographic record of the eclipse. A Fellow of the Royal Astronomical Society, writing to us on the subject, has some excellent remarks, from which we make one or two extracts. After calling our attention to "the ignominious failure of the photographic part of the expedition," he adds, that it seems to have occurred "simply because, to the best of my knowledge, there was not an experienced photographer among the expedition who knew how to prevent the nitrate of silver solution becoming so concentrated that it produced a mass of spots. It is true, a certain number of the party had been taught the operations of photography at Crauford Observatory (*i.e.*, W. De la Rue's) shortly before starting; but was that sufficient to insure success? Why not have procured the services of an experienced photographer, such as accompanied the expedition to Spain, in the person of Mr. Downs (of the firm of Cundal and Downs) an 'old hand' at all the ins and outs of photography? Or, perhaps, better still, the expedition might have procured the services of an Indian photographer who knew how to arrest the rapid concentration of nitrate of silver!

"The German Expedition, as per your insertion of Dr. Vogel's letter, have secured three perfect negatives *without spots*. And why? Because the party composing that expedition numbered at least *three thoroughly experienced* photographers among them, clearly showing that they, at least, knew what was wanted to insure success as regards the photographic part of the expedition.

'What excuse has the Royal Society for this signal

failure? for every practical photographer who has read Dr. Vogel's letter, and who now reads Major Tennant's, cannot fail to divine the cause of non-success of the English Expedition."

This expedition was sent out by the Royal Society, aided by Government, and we fear very much that it is to the aid of the latter much of the failure may be attributed. It is probable, in fact, that it is due to red tape. A staff of men provided by Government might or might not be fitted in all respects for the work; but if the men "told off" for the duty knew nothing of photography, it would be against all precedent to import a photographer from another department. If the men were selected from the Engineers, and they were not familiar with photographic operations, it would be quite inadmissible to introduce amongst them men from (say) the Artillery, who were skilled photographers. It is probable, from what we can learn, that to a cause of this kind the failure in result was due. Be this as it may, however, it appears tolerably clear that no experienced photographer formed part of the expedition staff, or we should not have heard of such puerile difficulties as spots from concentration of the silver solution.

The photographic operations of the German expedition, so well described in our columns, were admirable in their systematic prevision. Possible forms of failure were anticipated and carefully provided against. The condition of the various chemicals was carefully tested, and the relative working conditions of various collodions ascertained under the precise circumstances in which they would be required. Preliminary exposures were tried on the spot. In short, everything was so well rehearsed, and every one so carefully told off to his duty, that failure from preventable causes was scarcely possible. If this expedition were distinguished by anything of military routine, it was in the efficient drill by which they prepared themselves for actual operations; whilst the one military element which was missing in the expedition in India was this effective drill.

We have in this country several photographers of high repute and great practical skill who have had experience in Eastern photography, and who have succeeded amid the gravest difficulties. We refer to such men as Bedford, and Frith, and Goode. Surely it would have been possible to have secured the services of some of these or other experienced photographers, to whom the purely photographic operations should have been confided, and who would have certainly secured immunity from the disasters attending concentrated silver solutions, and probably, also, from the risk of under-exposure.

We add here the remaining paragraphs of Major Tennant's letter to the Astronomer-Royal:—

Capt. Branfill reports the protuberances unpolarized, and the corona strongly polarized everywhere in a plane passing through the centre of the sun.

Complementarily, I have to report a continuous spectrum from the corona, and one of bright lines from the prominence I examined. I am, I believe, safe in saying that three of the lines in the spectrum of the protuberances correspond to C, D, and b. I saw a line in the green near F, but I had lost so much time in finding the protuberance (owing to the finder having changed its adjustment since last night) that I lost it in the sunlight before measuring it, and I believe I saw traces of a line in the blue near G, but to see them clearly involves a very large change in the focus of the telescope, which was out of the question then.

I conclude that my result is, that the atmosphere of the sun is mainly of non-luminous (or faintly luminous) gas at a short distance from the limb of the sun. It may have had faintly luminous lines, but I had to open the jaws a good deal to get what I could see at first, and, consequently, the lines would be diffused somewhat; still, I think I should have seen them. The prominence I examined was a very high narrow one, almost to my eye like a bit of the sun through a clink in brightness and colour (I could see no tinge of colour), and somewhat zigzagged, like a flash of lightning. It must have been three minutes high, for it was on the preceding side of the sun near the vertex, and was a marked object, both in the last photo plate just before the sun reappeared, and to the eye.

Captain Branfill saw the prominences coloured, as did two other gentlemen; but one in my observatory (like myself) only saw it

white. I should, however, say that for long I never saw a *Orionis* markedly red, nor *Antares*, and I may not catch red soon, though I cannot conceive this being so.

In conclusion, I may note that the darkness was very slight, and the colour not half so gloomy as in the eclipse of 1857, which was partial at Delhi, where I was then.

The spectroscopic examination of the eclipse by Lieut. Herschel, given in a letter to Mr. Huggins, will be read with interest by many photographers:—

The week preceding the event had quite prepared me for disappointment. There seems to be an annual cloudy and rainy season at Jamkandi, which lasts about a fortnight, and was said to be somewhat later and more marked than usual this year. The morning broke, however, as usual, clear, but the driving monsoon clouds soon showed the kind of sky we were to expect. About a quarter of a minute before totality a thick cloud obscured the sun. I had placed the slit (of the spectroscope) so as to cross the crescent at about the vanishing point of the limb, and was watching the narrow solar spectrum grow rapidly narrower. You may conceive the state of nervous tension at this moment. Whatever the corona was competent to show must in a few seconds have been revealed—unless, indeed, it should so happen that a prominence should be situated at that precise spot, in which case the double spectrum would be presented. But the solar spectrum faded out while it had still appreciable width, and I knew a cloud was the cause. I went to the finder, removed the dark glass, and waited—in that fever of philosophical impatience which recognizes the futility of irritation, even while it chafes under the knowledge of fleeting seconds—how long I cannot say, perhaps half a minute. I can well recall the kind of frenzied temptation to turn screws and look somewhere else, checked by the calm ticking of the clock, telling of a firm hold of the right place, cloud or no cloud. Soon the cloud hurried over, following the moon's direction, and therefore revealing first the upper limb, with its radiating, and, as I fancied, scintillating corona, and then the lower limb. Instantly I marked a prominence near the needle point in the finder. A rapid turn of the tangent screw covered it with the point of the needle. Those few seconds of unveiling were practically all that I saw of the eclipse as a spectator. With the exception of a hurried glance into the finder at a later period, to watch for another break, I was the whole time engaged at the spectroscope. I have not the remotest idea, from actual experience, of the external phenomena which were present to the thousands of upturned faces whose voices I heard outside. I might easily have lifted the curtain and looked out while the clouds were obstructing. That I did not do so is only to be explained by the absence of mind, as regarded all else, produced by the concentration of attention on the problem before me. To return: the instant the prominence was under the needle point, I returned to the spectroscope. A single glance solved the problem in great measure. Three vivid lines—red, orange, blue! No others, no trace of a continuous spectrum. I think I was a little excited about this time, for I shouted, quite unnecessarily, to my recorder, "Red, green, yellow!" quite conscious of the fact that I meant orange and blue. I lost no time in applying myself to measurement. And here I hesitate; I have no idea how those five minutes passed so quickly. Clouds were evidently passing continually, for the lines were only visible occasionally. The red must have been less vivid than the orange, for after a short attempt to measure it I passed on to secure the orange, and, succeeding to my satisfaction, tried for the blue line. Here I was less successful. The glimpses of light were rarer and feebler, the line itself growing shorter and further from the cross. I did, however, place the cross very near the true position, and got a reading just as the re-illumination of the field of view informed me that the sun had reappeared on the other limb. I consider there can be no question that the orange line was identical with D (sodium), so far, at least, as the instrument is competent to establish an identity. I also consider that the identity of the blue line with F (hydrogen) is not established; on the contrary, I believe that the former is less refracted than F, but not much. With respect to the red line, I hesitate much in assigning an approximate place. It might have been near C (hydrogen). I doubt its being so far as B, but there would be its limits. The corona may have projected a spectrum of some kind, but I saw none. I therefore conclude it was a faint solar spectrum, a conclusion in accordance with other characteristics of the phenomenon, but especially with the (flickering?) radiating appearance, and with the satisfactory determination by Lieutenant W. M. Campbell, R.E., of the conditions of polarization obtaining in the corona. At present it is sufficient to state that these observations leave no doubt that the light of the corona is polarized in places passing through the sun's centre. I have had no communication with any other observers since the event. I am curious to learn how far our results will corroborate each other.

UNEVEN DRYING OF SENSITIZED ALBUMINIZED PAPER.

A DIFFICULTY, the cause of which is not well understood, but which is productive of most annoying results, is sometimes troublesome to photographers. We refer to the uneven drying of the excited albuminized paper. Instead of the solution draining and evaporating evenly, a portion of it remains standing in drops, at greater or less intervals, all over the surface of the sheet. These drops dry, of course, very slowly, and in the finished print their places are marked out by grey spots of less vigour than the remainder of the image.

Various causes have been assigned for this irregular drying, and various remedies suggested, but considerable uncertainty as to the actual cause or cure remains. One reason for its occurrence, suggested by a manufacturer of albuminized paper, is the use of a nitrate bath much stronger than is required by his paper, which, being lightly salted, does not require a strong bath. No reason was stated for the unsatisfactory action of a strong bath; it was simply said that experience had shown that the trouble in question followed the use of a strong bath, and disappeared when a weak one—or, rather, one of the proper strength—was used. The probable explanation of that fact is, that very rapid and very complete coagulation was produced by the strong bath, and the very horny surface had a somewhat repellent action on the solution, causing it to run into drops instead of draining and drying evenly. Another manufacturer of albuminized paper, Herr Schering, of Berlin, sent an interesting communication to our columns, stating that the defect in question was often the result of the paper having been kept in a very dry place before sensitizing, and that the defect would disappear if the paper were placed in a cellar or damp place for a few hours before it was floated on the silver solution. The only time we met with the trouble ourselves we found this plan proved a remedy; but we have repeatedly had cases brought under our attention in which neither remedy proved efficient. One simple and certain cure remained, but it was troublesome, and sometimes introduced another evil. If, instead of allowing the excited sheet to dry in the ordinary way, it was blotted off with clean bibulous paper, there was, of course, no risk of uneven drying. Adopting this course has generally proved quite satisfactory, but in some instances it has been alleged that the prints on such paper possessed less vigour, owing to the removal of the free nitrate by the blotting-paper.

A correspondent in India has recently sent us another remedy, which he finds to give eminently satisfactory results in every way. We may mention, by the way, that our receipt of this suggestion affords an interesting illustration of the wide-spread community of feeling which the devotion to a pursuit of mutual interest engenders. Three months ago, a correspondent, simply signing the initials "J. S.," in our columns, mentions his difficulty. Another photographer, a major of cavalry in the Punjab, reading his *News*, and seeing this difficulty mentioned, writes a letter to "J. S." to give him a remedy which he has found to be a perfect cure. The letter is forwarded to us for "J. S.," with a suggestion that we should make the recipe public, if we think it worthy. "J. S." and his address are alike unknown to us: a great many of our correspondents in difficulties give us no clue to their identity; nor is it necessary that they should. In case of letters for publication it is, as a rule, necessary that we should receive the name and address of the writers; but we are well content that applicants for advice should preserve their incognito. "J. S." will, however, doubtless see in our columns the letter intended for him, which we now subjoin.

"Rajapore, Punjab, India, 29th August, 1868.

"MY DEAR SIR,—I have just received my PHOTOGRAPHIC NEWS of the 24th ult., and have noticed that you are in just the same fix as I was, until a short time ago, when a friend helped me out of my difficulty by recommending a dodger

whereby to put an effectual stopper to the *uneven drying of the sensitizing solution on albuminized paper*. With the hope that you may find it as effective as I have, I send it to you; viz. —

"Beat up the white of an egg *well* in 4 ounces of distilled water; add to this 4 ounces of the ordinary silver printing solution; allow this to settle, and, rejecting the sediment, add a portion of the solution to the paper sensitizing bath. If the *blisters* still continue to appear, add more of the solution till the evil is eradicated.

"Isolated, as I am here, on the borders of a desert, you can readily imagine the many and great difficulties I, as an amateur in photography, have to contend with, and can, therefore, the more readily imagine my delight and surprise to find the above recipe the *very thing* I wanted. The strength of my sensitizing bath is now only 50 grains to the ounce, and I secure as rich and vigorous prints as if I were using a 90-grain solution.

"I shall be glad to learn that the remedy has proved as successful with you as it has done with me. My toning bath is the old acetate of soda one:—

Acetate of soda	...	...	30 grains
Chloride of gold	...	...	1 grain
Distilled water	...	...	8 ounces.

Mix the soda and gold in an ounce of the water, and let stand for half-an-hour; add the rest of the water, and tone."

ON THE APPLICATION OF THE CAMERA-OBSCURA TO HARBOUR DEFENCE.

For some time past the subject of defending harbours and rivers by means of submarine mines or torpedoes has received much attention in military circles. In this country a committee, entitled the "Floating Obstruction Committee," has been for some years past engaged in considering the best and most efficient method of employing explosive machines in warfare of this description, and in studying the most certain and readiest manner of planting and igniting the same. In Austria, also, during the late German war, the subject excited much interest, and, under the superintendence of Baron von Ebner, a distinguished officer of Engineers, the lagoons of Venice were strongly fortified with torpedoes, consisting of stout metal cases containing charges of from one to five hundred pounds of gun-cotton. Some of these machines were, we believe, automatic, or self-igniting, on their coming into contact with an enemy's vessel, but the majority were connected by means of insulated wires with the shore, whence they could be exploded at the will of an operator placed so as to command a view of the whole expanse of water.

During the past month experiments have been made by the Belgian Engineers at Antwerp, with a view to effect a perfect system of fortification on the Scheldt, by means of submarine explosive mines. The method adopted was very similar to that pursued at Venice, and appears to have given great satisfaction to the Belgian authorities. The mode of proceeding was as follows:—

At a convenient and sheltered spot near the expanse of water to be planted with torpedoes was constructed a camera-obscura of the ordinary description, the lens of which was so fitted as to be perfectly rigid and immovable, the picture being reflected upon a white convex surface sufficiently large to include a reproduction of the space to be defended. A vessel proceeds to lay the torpedoes in any line or position that may have been determined upon, and whenever the vessel stops to sink a charge, an operator, who is watching the ships' movements upon the table of the camera-obscura, proceeds to mark the exact spot upon the board, attaching to each mark a consecutive number. Insulated wires are led from each torpedo to the interior of the camera, and placed in the same order, or marked with the same numbers, as those upon the table, which refers to their respective whereabouts. By this means the operator

is enabled to watch the approach of an enemy's vessel over the apparently unobstructed water, and to explode any specific torpedo over which the unlucky ship may chance to pass.

This seems a very simple method of operating, and although it has never been tested in actual warfare, inasmuch as Venice was never attacked by sea during the late war, there is every prospect of the plan working efficiently. The Belgian Engineer officers were so delighted with the efficacy of the method that they have at once recommended the institution a further and more extended trial; the only weakness observed in the system was, that it is perfectly useless by night, a fault, however, which is inherent with every method of optical observation. At night, when the landscape is so dark that no picture is reflected upon the camera table, the observation of the surface of the water by means of a telescope would be equally without result; and it could only be when the torpedoes themselves were insulated and connected with a galvanometer on shore, so that the fact of any body touching the machine would be recorded by the completion of the circuit and a movement of the galvanometer, that the approach of any vessel could be made known. A combination of the camera-obscura and self-recording systems of torpedo defence would, we believe, constitute a perfectly trustworthy method of carrying on this description of warfare.

MODES OF LIGHTING THE SITTER.

BY JOHN BEATTIE.

Will you allow me space for a few remarks in addition to the quantity of sense and nonsense that has been written upon the almost all-important subject to a photographer, his best method of using light?

I give them not dogmatically, nor as food for discussion, but simply as my experience. I have made use of a due-south light for eleven years; my glass house was 30 feet by 12 feet, and fifteen degrees from due south and north; side walls 11 feet high, a very sharp angle "A" roof, 8 feet of glass in the roof, and perpendicular towards the east; the sitter was placed at the north end. The windows were fitted carefully with valves, coloured pure white on one side and black upon the other; and the *whole* of the inside of the building painted a dead-slate black. On the right side of the sitter I had a canvas, neatly stretched upon a frame, and painted pure white; upon this worked a black curtain, and by this means I got my inner half-shades. The time of my sittings was from two to eight seconds. Such was my plan of working a south light, which, if got free from reflected impure light coming from immediate surroundings, I would prefer to any other for use in this country.

What so many overlook is, the fact that every object in the glass room is throwing back its colour in the face of the sitter, and that is done with an intensity in proportion to the amount of diffuse light in the room; and to the same proportion lengthening the sitting and flattening the picture produced.

I will give two instances out of many I could quote. When travelling this last summer, I called upon one who was much troubled with weak pictures with dirty shadows; he had tried all collodions and developers ever used or thought of. His light was well placed, but far too much of it. The inside of his glass house was light grey. His sittings were twenty-five seconds. He closed out six feet of glass, painted all the surfaces black, got his reflector for half-tone; his sittings were reduced to five seconds, with finely-marked pictures as the result. Another had a very large room, with enough of glass in it for a crystal palace—immense surfaces of glass in front of his sitter; he was large in his knowledge, and pugnacious when reasoned with; but I observed he sat, with a good lens and moderate light, forty seconds.

Now what is really wanted? A pure light, unaffected by reflections from houses or any other surfaces, passing through

as small a space as may be deemed judicious, well directed upon the sitter. There must be no influence, either above or around, to the least oppress the countenance or render the pupil of the eye small; all must give a sense of comfort.

With above conditions, and a keen sense of beauty and grace on the part of the artist, fine results will follow; amongst those results (presupposing moral conditions present) will be plenty of employment at remunerative prices.

Lastly, I believe if artists would look for genteel situations, though private, where fine light could be obtained, instead of public places, with too often bad light as the result (after all, it is the work that is got out into society that makes the success, and not the samples placed at the entrance), they would be more sure of gaining a position.

13, Buckingham Gate, Clifton, October 19th, 1868.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. ROVEY.

CONCLUDING REMARKS ON TONING, ETC.

A short time since a correspondent, writing to the Editor of the News, was especially severe in his remarks on account of my having recommended the use of a minute quantity of free nitrate in the toning bath. I trust that ere this the gentleman alluded to has studied my comments on toning matters with sufficient attention to glean therefrom the fact that, however he might conceive it necessary to eradicate every particle of free nitrate from prints intended to be toned by the methods advised by his accepted authorities, the adoption of my formula renders it imperative that the prints undergo a brief wash only, prior to their entering the toning solution, for the following reason, the quantity of chlorine is so limited that it is too feeble to attack silver reduced by light; and were it not for the more readily reduced free nitrate, toning would proceed very slowly indeed, and, not unfrequently, the bath would be entirely inert. The conditions differ when the carbonate of soda bath is employed, for except the carbonate of soda has been added in excessive quantity, the chlorine freely attacks and reduces the silver of which the print is composed, and toning action is set up and continues until the requisite amount of free chlorine is exhausted. That free nitrate of silver is capable of setting up toning action was amply proved under circumstances I now proceed to describe.

A sample of paper was sent me by a friend who was desirous that I should try my hand on an unusually obstinate article. The surface of the paper was horny and extremely brilliant, as if the coating consisted of the thickest of albumen, and the drying effected at a high temperature. On floating the sheets on the silver bath the albumen proved impervious to the action of the fluid, for when lifted off the bath the liquid collected in globules on the surface of the paper; and printing under such adverse conditions was, of course, an impossibility. To remedy the evil I reduced the strength of the silver bath, and thus conquered difficulty number one. But why reduce the density and strength of the bath? Simply because I deemed it requisite to allow the water to remain for use a portion of its solvent powers, which acted on the albumen, and so gave admission to a uniform supply of silver. The printing on the sheets thus sensitized proceeded satisfactorily, and all went well until the prints were immersed in the toning solution, when I found myself once more at fault, for toning action there was none. This set me once more cogitating, and, on reviewing the conduct of the prints in the washing water, it occurred to me that the water extracted only a very minute quantity of free silver. Reason why: the comparatively impervious condition of the albumen caused the film of silver to be of an extremely superficial kind, and as the chlorides had failed to unite with silver throughout the whole thickness of the albumen, the pictures were formed on the outer surface only, and no interstices were present in which free silver could

obtain a seat. I might have found an effective remedy by further diluting the silver bath, but I did not wish to lose the prints that were in the toning solution; besides, as the pictures were remarkably delicate and brilliant, I was desirous of retaining those good qualities; so, to effect my object, I added a few drops of a weak silver solution to the toning bath, when, to my gratification, I found my anticipations realized, and the prints passed through the ordeal triumphantly. Had I been using the ordinary gold bath, as generally adopted, toning action would have proceeded immediately the prints were exposed to its influence, the reduced silver surface would have been attacked, and that attack would have resulted in a ruined batch of prints—a rich yield of the vilest form of mealiness, as the slightest reduction of the prints must have destroyed all their claims to the beautiful. The gold bath, which was prepared by the simple formula I have provided, could not act on the reduced silver, and as long as the feeble chlorine found nothing it could act upon, toning action was in abeyance; but directly the free silver was provided, the chlorine found work suiting its capabilities, and all ended satisfactorily. I subsequently used up a ream of the same kind of paper, and suffered no further difficulty. But it strikes me that I have said enough about toning baths, and may now dismiss the subject by removing the prints from the toning fluid to another dish that contains the washing water.

(To be continued.)

PRINT-WASHING AIDED BY OSMOTIC ACTION.

BY W. J. LAND.*

THE perfect removal of hyposulphites from photographic prints in the shortest space of time possible is a desideratum worthy of study by every lover of photography. Having made a few experiments to test the value of osmotic action as an aid in washing prints, and believing that hyposulphite can be removed in a shorter time by this method than any other known—excepting, probably, the treatment with peroxide of hydrogen or chlorine, both of which agents are apt to injure the finer half-tones—I offer the following, hoping that it may be of interest to the practical photographer.

When a print is removed from its hypo fixing bath, and thrown into a vessel of warm water, a strong osmotic action takes place, the albumen film acting as an excellent *septum* to the thousands of hypo-vesicles just beneath. At a temperature of 130° Fahrenheit the paper rapidly gives up its hyposulphite, and this strange action soon becomes much weakened, and unable to give up the remnant of the pernicious salt, unless agitation or other mechanical means is brought to its assistance. If, however, after a few minutes, the print, which has now lost the greater portion of its hypo, be transferred to a ten per cent. solution of (tribasic) phosphate of soda, a stronger and more rapid osmosis is again set up, and much of the remaining hyposulphite is soon diffused in the solution of phosphate of soda. If, further, at the end of eight minutes, the print is transferred from this solution to a new portion of warm water, the (reverse) action is continued, and, by a dozen such alternations (using fresh portions of the liquids at each transfer), the print may be freed from its destructive enemy within one hundred minutes, if the temperature of the liquids is kept up as high as 140° Fahrenheit, and eight minutes be allowed for action in each liquid. Lastly, the apparently harmless phosphate may be sufficiently removed by short treatment with successive portions of hot water.

The apparatus which I use for the convenient working of the process consists of a couple of two-gallon tin cans, with faucets soldered near the bottoms; these may be placed on an iron stand, and the temperature of the solution and water maintained at 140° by a Bunsen burner, which may be shifted from one vessel to the other as occasion requires. The deep porcelain trays in the market

* Philadelphia Photographer.

serve admirably as washing vessels in small operations. The cheapness of ordinary phosphate of soda makes the process an economical one: moreover, the quantity of solution required is just sufficient to cover the prints well, and allow of gentle agitation, that they may be kept separated, to allow of uniform action. Phosphate of soda was adopted on account of its great osmotic power. Chloride of sodium was tried, but found too weak and slow in its action. It is well known that all septa, allowing rapid osmosis, are more or less injured by chemical action; but in this case the albumen suffers so slightly as to withstand all but microscopical scrutiny. This process, if not practised as here described, can be used as a subsequent treatment (making but two or three alternations), thus economizing to a greater extent.

ON THE RELATION BETWEEN INTENSITY AND TONE.

BY NELSON K. CHERRILL.*

LET us now turn from out of doors to the studio. Let us suppose a child to be taken: very fair, very light hair, light blue eyes, white dress, and (if any) light blue ribbon round the neck. This seems to me very like our first view of the sea, all white—no intensity, no tone, no contrast. Does it matter how much you intensify the negative? I think not; an intense negative will print more slowly, and, perhaps, give a better colour in the print, but a very weak one will give all the tone there is in the picture. Now let us imagine a change: the child has grown, her hair has darkened, they have given her brown ribbon for her neck, and she now wears a coloured dress. Is it now a matter of indifference as to the intensity of the negative? I think not. There is more tone in the picture, there is more intensity of contrast in nature, and, therefore, more need of hitting the relative tone of various parts in the picture when finished. But let us take a third case. The girl has grown to woman's estate; she comes decked in gorgeous apparel; she wears black velvet for her dress, and pearls for her head-dress; her eyes are dark and lustrous, and her complexion fair and delicate. Now is it any matter of indifference as to the intensity of the negative? *Certainly not.* We are certain that the blacks of black velvet are black, and that the high lights of a fair face are white, and that the spots of light upon a tiara of pearls are bright, like stars, and, therefore, any negative which will give less than the whole range of tone from white to black will not do justice to our sitter. This, I believe, and this alone, to be the great secret of M. Adam-Salomon's brilliant effects of lighting: that he gets subjects which will give a full range of tone from white to black, and he so manages the intensity of his negatives that his prints give the nearest approach possible to the scale of gradation in nature.

From what I have now advanced, it will be thought that the greater the range of tone in the picture required, so much the greater intensity is needed in the negative; and this is to a certain extent true, but not altogether. The greatest or deepest black we can represent in a negative is absolutely clear glass; we cannot go farther than this; we cannot have less than nothing for the darks of our picture; but the quality of black which clear glass in the negative will give in the print is dependent upon the intensity of the lights, and so clear glass in the darkest part must, to give its full value, be supported by enough intensity in the high light to give pure white. But, at the same time, it is quite useless to have more than enough intensity in the lights, because the black can only be black, and if we have too much intensity in the lights we shall lose some of the darker tints, as they will be all buried in black together. So, then, while I partly agree with those who say that a negative should be quite opaque in its highest lights, I am not prepared to admit the absolute truth of the proposition. The proper intensity for the very highest light of all in the picture is

just that which will screen the paper under it from the action of the light till the blackest black is printed as deep as the process will admit; less intense it should not be, as then either the blacks must suffer in not being deep enough, or else the lights will be too much printed; more intense it must not be, as then either some colours not quite black will be lost, or else the lights will be too white. Perfect tone, or harmony of tone, it will thus be seen, depends more upon the intensity of a negative being exactly right than on anything else. The intensity of the negative is much dependent upon the form of the studio in which it is taken; an ill-constructed studio will give either too much contrast of light and shade, or too little; but whichever it gives, if, by dodging the development, you can get the intensity right, the pictures will be right in tone and gradation. The difficulty is, as I say, to get the intensity right when the studio is badly constructed. If, for instance, there be too much side light, the difficulty is not so much to get detail on the shade side of the face, as to avoid getting too much intensity on the side nearest to the light, and thus the pictures produced will have a harsh, black-and-white tone, instead of the beautiful gradation seen in nature.

I have hitherto been speaking only of particular instances of this relation between tone and intensity; but before concluding the present paper I wish to make one or two more general considerations. I think that if what I have advanced about the three stages of the portrait we had under consideration just now is true, we may make the following general propositions:—That the greater the number of gradations in a picture, the greater the need to pay especial attention to the exact intensity of the negative. And this leads me to a consideration of the greatest moment. What is to be considered a normal intensity for the high light of a picture? At present I am afraid I must say I do not know. It is a fact, and one much to be regretted, that paper (albuminized paper) is so various in its quality that the greatest uncertainty prevails as to what the intensity should be to give a certain result. It would conduce greatly to aid the photographer in the production of perfect work if the makers of albuminized paper would agree among themselves as to some standard by which, and up to which, they would work. At present no two papers in the market are alike: one gives, as the maker will say, "fine rich, warm tones," and another, tones with two or three other adjectives, varying according to the idiosyncrasy of the maker, or, possibly, with the probable credulity of the buyer.

In doing small portraits, such as cartes-de-visite, the exact range of tone is of much less consequence than in larger sizes; hence the greater technical difficulty in the larger pictures. It is by no means difficult to get a paper that will give good proofs from carte-de-visite negatives, but it is a very difficult thing to find one that will print a 10 by 8 portrait à la Salomon; and when you have found the paper, the negatives must be made of just the right intensity to suit that paper. Until paper makers will make us a uniform article, I am afraid we have no choice but to vary our negatives to suit the paper. For those who would succeed with portraits in the style of M. Adam-Salomon, it is imperatively necessary to get a paper which will give very considerable depth of tone in the blacks. One of the greatest faults with paper now-a-days is, that it is suited to such thin, weak negatives; it will not bear any depth in the shadows without bronzing all over.

I have all along been speaking of negatives in which the gradation of colour begins with clear glass, because any fog on the shadows is to my mind most detrimental to good work; indeed, I do not think any amount of intensity in the high lights can compensate for want of clear glass in the extreme blacks. Fog in the shadows was quite an understood thing in the days of waxed paper negatives, when the shadows were veiled with the substance of the paper, but now that good collodion can be bought at any photographic shop, and that all photographers know how to manage the baths and other chemicals, fog ought to be

* Continued from p. 499.

quite an unknown evil. The great reason why I so much object to fog on the negative is, that not only it involves an enormous expenditure of time in printing, but the result is by no means so fine when obtained. A perfect negative will, with good paper, give *grey* high lights and rich warm blacks in the same picture, but if there be any fog on the shadow, just in proportion to its amount will be the lack of that beautiful and peculiar property. The reason of this greyness of a picture in the light, when made under favourable circumstances, I take to be twofold: firstly, some peculiar substance used in the preparation of the paper, which gives the result in M. Adam-Salomon's works in a slightly more marked degree than I have seen it elsewhere; and, secondly, the well-known tendency of the print to tone greyer when the light is feeble than when it is strong, the light which reaches the print through the high lights of a picture being much more feeble than that which passes through the shadows unimpeded.

I cannot conclude this paper without adverting for a moment to that grand field of labour and enquiry which has recently formed part of a series of papers by Mr. H. P. Robinson, in the *PHOTOGRAPHIC NEWS*; I refer to the *chiaroscuro* of photography. It is in the study of this most interesting of topics that the true and grand relations of light to shade, and of tone to intensity, develop themselves. It is only when photography is studied as an art that these relations can be seen and appreciated, and it is only then that they can be really useful in guiding the everyday practice of photographers. I have endeavoured to treat the subject without any reference to these papers, and to consider it in a more mechanical light, from a feeling that such was first needed before the high branch of *chiaroscuro* came under consideration; but for those who wish to carry the subject further than I have been able in my present imperfect attempt, I would certainly suggest a careful perusal of Mr. Robinson's papers on the subject. For those who would succeed with portraits in M. Adam-Salomon's style, I would suggest particular attention to the intensity of the negative, as being mechanically one of the most important means to secure the full range of tone to be found in his pictures. And to all who would succeed more than they have done hitherto, I would suggest still more attention to the intensity of the negative, as a good negative will not only save time and material in printing, but will also render it easier to satisfy that most discerning of critics—the public.

TO SWING, TO TILT, OR TO LEVEL?

THAT IS THE QUESTION.

BY PROF. JOHN TOWLER, M.D.*

AN important question, forsooth, when it has reference to the camera, and one that is worthy of discussion.

Some cameras are supplied with what are termed swing-backs. The swing-back derives its name from the swinging of the plate-holder and the ground glass upon a horizontal axis, which allows either the top or bottom of the same to approach to or recede from the front of the camera. In addition to this motion, some plate-holders and ground glasses have a swinging motion upon a vertical axis, which allows the sides to approach to or recede from the front of the camera supporting the lens.

To tilt and to level the camera need no explanation.

It is our purpose to examine the theory and practice of the swing and the tilt, and then to march a step or two on level ground. We cannot well dispense with a figure to illustrate this important subject, and we select the square tower or steeple of a church for the object to be photographed. Let A B represent this steeple, L the lens, and *a b* the ground glass, which, in the first instance, is parallel with the steeple. It is evident that the distance A L is greater than the dis-

tance B L. Now, we know from the relative bearing of *m* and *n* in the equation for conjugate foci—

$$\left(\frac{1}{f} = \frac{1}{m} + \frac{1}{n}\right)$$

that, as *m* increases, *n* decreases, and *vice versa*; therefore,



if B L increases and becomes A L, *L b* must decrease until it becomes *L a*. From this we learn that if *b a* is to be an accurate picture on the ground glass of A B, *L a* must be less than *L b*; but in the figure the reverse is the case; consequently, *a b* cannot be an accurate picture of the object. Now, in order that *a b* may be an accurate picture of the steeple, the two triangles must be similar—that is, the triangle A L B and *a l b*—and, since conjugate distances are inversely as real distances, the long sides must be both either above or below; that is, in the example, the sides A L and *L b* respectively must be greater than B L and *L a*. This being the case, the angle at *b* must be equal to the angle at A, and the angle at *a* equal to the angle at B. In the figure this is not the case, and in order to make these angles in accordance with the enunciation, the line *L b* must be made longer than *L a*. Let *L c* be this line, and the angle *c* equal to the angle A, then *c a* will be the picture of A B. In order, therefore, to make these two triangles equal, the ground glass *b a* must swing back upon the point *a* as a centre, until it gain the position *c a*. This is the theory of the case. Now for the practice.

Fix the camera level or horizontal upon its tripod, at a proper distance from the steeple, and focus the top of the steeple quite sharp at the bottom of the ground glass. You will find the bottom of the steeple far from being sharp on the ground glass, but by drawing back the top of the ground glass from its parallelism with the front of the camera, towards *c*, the picture of this point will come more and more into focus until you arrive at *c*. Practice and theory, therefore, coincide, as they always must; otherwise, the theory is false. Now, although the top and bottom are in focus, this is no reason why the whole length of the steeple should be in focus; this would be the case if the point B, on the line A B, were the nearest point to the lens; D is a point as high from the ground as the lens, and is, consequently, the shortest distance from the steeple to the lens; and, since D L is less than B L, the picture or focus of D must be further off from L than L *c*; and the picture of all the parts of the steeple from B to E (E D is twice the distance E B) will be found behind the ground glass *c a*, whilst the distance E A will be represented on the ground glass. If, therefore, you focus upon the top of the steeple, and swing the ground glass back until the bottom is in focus, the part E B will be slightly out of focus; whereas, if the back be swung until D is in focus, then the part A D will be sharp, and D B alone will be out of focus.

There is, consequently, an apparent advantage in the swing-back. Now the same result can be obtained by tilting the camera on a horizontal axis supposed to pass through the lens, until the ground-glass in this case is parallel with the position of the ground-glass when in the previous case swung back, and then, by focussing the point D of the steeple, the top of the steeple and all the intermediate parts from D to A will also be in focus.

To tilt the camera and to swing the back, therefore, produce equivalent results as regards sharpness of focus, but there is a slight difference between these results in favour

of the swing-back, for, in tilting the camera, you will observe, in practice, that the ground-glass, through its whole extent, has to be drawn back a distance equal to the distance at the top which was swung. This causes the conjugate focal length to be slightly greater when the camera is tilted than when the camera is kept level and the ground-glass is swung back; and this little difference produces a disadvantage for the tilting.

When the camera is horizontal, the picture is not accurately in focus, but an approximation to sharpness may be obtained by what is called equalization of focus; that is, by focussing more upon the middle or above the middle parts of the steeple, when both the top and bottom will be nearly in focus.

Now let us examine the results of sharp focussing in the two cases of swinging and tilting.

In optics it is a well-known fact that the size of the picture of an object varies inversely as its distances from a lens; that is, the greater the distance of the object from the lens, the less the picture. Let this principle be examined in reference to the space on the steeple situated between two parallel lines; since the top of the steeple is more remote from the lens than the point D, the picture of this top space will be narrower than that of the space at D; that is, the parallel lines must converge towards the top. Hence, in both cases (of tilting and swinging) all parallel lines of objects higher than the lens converge upwards; and, if the objects are lower than the lens, downwards. But the convergence is slightly greater by tilting than by swinging the back, owing to the slight difference in the absolute conjugate focal length in the former above alluded to. The consequence of this convergence is that the steeple will appear to be the frustum of a pyramid; and if you focus on the point D, the parallel lines of the steeple will converge in the picture from *d* to *c*, and from *d* to *a* in both directions, up and down. This will cause the lines of the picture to be barrel-shaped, or, still better, like the sides of a lamp-chimney. This conversion of parallel lines into convergent lines can be avoided, to a great extent, by levelling the camera, both in the gallery and in the field, and by equalizing the focus.

You now know the facts of the three cases; draw your own conclusions, and work accordingly. In this exposition there is no condemnation; I sometimes avail myself of each case, but I prefer the horizontal when it is feasible.

Correspondence.

CLEANING OLD PLATES.

SIR,—Many suggestions have appeared in that part of the PHOTOGRAPHIC NEWS devoted to correspondence, respecting the cleaning of plates, and in removing the varnish and collodion film from all negatives. I have read carefully all that has been said at various times by your contributors on this subject, and have tried many experiments tending to solve this difficulty. If the method I adopt and here explain is not a complete solution, it is, at all events, superior to any that has hitherto crossed my observation, for its simplicity, inexpensiveness, and effect.

I use Gray's solution—or, what is commonly called by painters, liquid wash—adding clean water in equal proportion. Let the plates remain immersed in this for twenty-four hours or more. In taking the plates out, be careful to use a flat stick, or the finger-nails will be marked as though nitre of silver had been used. Have clean water at hand, or flow from a tap, to clear the plates from all superfluous wash; be prepared with a pad of cotton or wool to rub both sides of the plate, particularly the edges; half-a-dozen changes of clean water, slightly rubbing each time, will complete the process. Plates that have been considered useless through the presence of paint, varnish, grease, &c., I have thoroughly restored by the above simple method. I would also add that the liquid wash alone will remove varnish films in three or four hours.

During two days of the past week I have cleaned upwards of two hundred plates, varying in size from quarter-plates to 10 by 8's, in order to thoroughly test this process, which I now present to your readers.

P.S.—Many thanks to Mr. Bovey for his valuable recommendation of "sugar in the printing bath for the preservation of sensitive paper." Enclosed are four specimens of the paper, a week and a fortnight old. No. 1 was in the bath forty-eight hours; 2, 3, and 4 were upwards of twenty-four hours each. To Mr. Nelson K. Cherrill I am also indebted for his information on fixing and toning at once. The specimens enclosed are sent as evidence of the complete success of the above-named gentleman's communication. Remarks as to tone and the white will oblige,—Yours obediently, S. GARSIDE.

Church Street, Ambleside.

[The prints enclosed are excellent.—Ed.]

AMOUNT OF SALT USED IN ALBUMINIZING PAPER.

SIR,—At the North London Association I made a suggestion which, with your permission, I will give in the words as delivered, viz.: "I do not think that any manufacturer of albuminized paper—when asked—ever objects to give an approximate idea as to the amount of salt in his paper; but when photographers are so very anxious to ascertain the amount of salt in the paper, they can soak the albumen and salt from a quarter sheet, and precipitate with a standard solution of nitrate of silver." By a standard solution I mean (in speaking to a photographic public) any known strength—say the floating strengths of 40, 50, 60, 70, or 80 grains per ounce, as the case may be. Then, with a minim measure, how easy it will be to find the number of grains of nitrate it will take to satisfy a sheet, and so calculate the quantity required for the daily consumption, where proper instruments are not employed for the purpose!

This I take to be the aim of the few who now and then bring up the subject. If they desire further information, pray let me suggest that they commence at the first of their processes, and ask the collodion manufacturers the particular amounts of iodides, bromides, &c., with their respective bases, and particularly the preparation of the cotton and solvents. Possibly this would aid those who produce indifferent negatives about as much as the salting of the paper would those who get but indifferent prints, while others, using the same materials, produce the finest results without any trouble.

In the report of the meeting in your last I am made to suggest testing the paper with a standard solution of chloride of sodium. This is clearly a slip of the pen, but ought to be corrected. Had I accidentally made such a *lapsus lingue*, it would, doubtless, have been at once corrected in the meeting. Yours, &c., F. W. HART.

8, Kingsland Green.

[The misprint is better corrected, although no one would dream of attempting to precipitate common salt with common salt. We have a few words on the general subject in another column.—Ed.]

SIR,—I notice that at the last North London meeting Mr. Hart recommended photographers who were anxious to know the proportion of salt in albuminized paper to dissolve the salt and albumen off a quarter of a sheet, and precipitate it with a standard solution of nitrate of silver, I presume, although chloride of sodium, evidently by some error, appears in the report.

I wish to ask Mr. Hart how many photographers he thinks are prepared with apparatus for such an operation? How many could conduct it with sufficient delicacy and care to be of any service? And, finally, if it is not a little unfair to ask two photographers to take this trouble to ascertain a fact which the albuminizer should be able and willing to give him without any trouble at all? I cannot understand why it is that albuminizers seem to place themselves in antagonism to photographers on this point. The request that manufacturers should give some idea of the proportion of salt their paper contains has often been made, but has never brought any systematic compliance with the request. It has, on the other hand, so often evoked a querulous protest against the necessity, that one is tempted to believe some occult reason exists for the habitua

suppression of information about which there should not be a moment's dispute. Is it true that salt is used by the hand, rather than by the ounce? I have heard such wild statements made, but have not hitherto believed them.—Yours sincerely,
X.

DISTORTIONS AND PERSPECTIVE.

DEAR SIR,—Your correspondent, "John Anthony, M.D.," in his letter on the above subject in your issue of last week but one, falls into error.

He says:—"If you stand at a distance of twelve feet in front of a mirror, you see yourself as a spectator would see you who was twenty-four feet from you, or just as much behind the mirror as you are in front of it; if now you stretch your hand horizontally towards the mirror (call it three feet in advance of you), your hand will look to you enlarged; and well it may do so, for though it ought to appear as it would to a spectator at a distance of twenty-one feet, it will really look to you as if you had pushed it forward a distance of six feet; in fact, as if it was seen with the perspective enlargement of an object which was eighteen feet off the supposed spectator."

This is a mistake; it would look as it ought to do; viz., as if it were twenty-one feet from your eye, because your eye is situated, not at the tip of your finger, but in your head, which is three feet behind said tip, and therefore eighteen *plus* three feet from reflected image of hand.—Yours truly,

D. WINSTANLY.

Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—Our readers should not forget that the winter session of the Photographic Society will open with an exhibition, as it did last year, to which all photographers, members and non-members, are invited to contribute. It will, as before, be held in the Architectural Gallery, 9, Conduit Street, opening on the evening of the 10th of next month. Members, their friends, and exhibitors will be invited to a social reunion, similar to that held last year, which proved so pleasant. The exhibition will remain open for a week. We shall have something more to say on the subject in our next.

POLYTECHNIC EXHIBITION.—Amongst several very attractive novelties recently introduced at the Polytechnic Institution in Regent Street, is an interesting and capitally illustrated lecture by Professor Pepper, on the late total eclipse of the sun, to which we especially commend the attention of our readers. An old German story is made the vehicle for introducing some of the startling optical effects which have during the past two or three years made the Polytechnic famous. A musical and scenic history of the Maid of Orleans gives occasion for the introduction of some of the finest lantern effects we have seen, both from photographic and painted slides. The other attractions—all excellent—are more numerous and varied than we can describe here.

CARBOLIC ACID IN THE BATH.—A correspondent says:—"I have tried carbolie acid added to the negative bath as recommended, and find it admirable in its effect, fully answering the purposes of additional rapidity and cleanness. I use, however, more than a trace; in fact, about the same proportion, or more, as I should nitric acid—i.e., about one drop to ten ounces of bath."

PHOTOGRAPHIC ART STUDIES.—Our contributor, "Respieo Finem," recently lamented the small appreciation and limited sale of such art studies as those of Mr. Reilander. We were glad to learn from that gentleman, in a recent conversation, that the sale of his various published pictorial photographs has recently become very brisk; so much so that he had difficulty in keeping up the supply. Our readers will share in our pleasure on learning such a fact. We hope, for their own sakes, that a large proportion of such pictures are bought by photographers.

PHOTOGRAPHY.—We have received from Mr. Fruwirth some specimens of his method of photography which admirably illustrate its capacity for some forms of art reproduction. An enlarged copy of an engraving entitled the "Two Grand-

mothers" is very excellent. The original is a print 9 inches by 8 inches; the phototype is about 13 inches by 10½ inches; and the rendering is clean, delicate, and perfect in a high degree.

PHOTO-LITHOGRAPHY.—We have received from our excellent confrère, Herr Schrank, editor of the Austrian photographic journal, the *Correspondenz*, a very fine and enlarged example of photo-lithography, from which we glean that they have advanced further in Vienna in rendering half-tone perfectly by photo-lithography than we have done in this country. The subject is a reproduction from a painting entitled "Die Lustigen Weiber von Windsor" ("The Merry Wives of Windsor"), rendering the scene in which Sir John Falstaff is being packed into the buck basket. The photo-lithograph is in size 16 by 12, and is well rendered in every gradation by an exceedingly fine grain, which gives the effect of half-tone perfectly. The names of the photo-lithographers appended are Reiffenstein and Rösch.

To Correspondents.

NORTHERN LIGHT sends us the following:—"Keeping and Dating Brown-iodized Collodion.—Statement for opinion of Editor of the PHOTOGRAPHIC NEWS.—Seeing your two articles on the above subject in the News of June 28 and October 11, last year I at once set to work to try my hand at the collodion iodized as therein set forth, and proceeded as follows:—No. 1. Having some of Keene's plain collodion in stock, I made up the iodizer for 15 ounces:—

Iodide of cadmium	...	...	...	100 grains
Bromide of cadmium	...	...	...	30 "

Dissolved in 5 ounces alcohol, sp. gr. 820, and added to the 15 ounces plain collodion—12th December, 1867. No. 2. To 15 ounces of Rouch's plain collodion I iodized with—

Iodide of cadmium	...	...	...	90 grains
Bromide of cadmium	...	...	...	30 "

Dissolved in 5 ounces alcohol, supplied by Rouch, and added to the plain collodion—25th December, 1867. I kept the lot in a dark and cool pantry, and tried both No. 1 and No. 2 last June, and found foggy negatives, but, otherwise, indications of good negatives; rather dense in the face, hands, and light drapery. Tried both No. 1 and No. 2 last week, and found again foggy negatives. Consulted Hardwich's Photo. Chemistry, and then added alcoholic tincture of iodine to the samples No. 1 and No. 2, and then found clear, clear negatives, but very much thinner and more like glass positives. The collodions, before the adding of tincture of iodine, were both colourless, and after the addition, straw colour. I expect that keeping the collodions for other six months or so might remove the tendency to fog; but as I want a bottle or so for immediate use, I beg to ask you whether you can oblige me with any other mode of treatment than adding the tincture of iodine, which seems to reduce the density of the negative rather too much. I can see from the indication beneath the fog that time will give me a most excellent collodion, only I fear it will be perhaps too dense in the whites and rather inclined to solarise. I am therefore anxious to know whether this tendency would be removed if I was yet to add some more bromide of cadmium, or what other treatment will help it." [There are various modes of dealing with the collodions described. In the first place, the tendency to fog might have been removed and the vigour retained by adding a smaller proportion of tincture of iodine; or, without altering the collodion, the tendency to fog might have been removed by adding a slight trace of acid to the bath; or, without altering either collodion or bath, the tendency might have been removed by adding a little more acid or a trace of gelatine to the developer. The tendency to excess of density in the lights would be best removed by giving a little fuller exposure, and avoiding prolongation of the development. It is probable that a slight modification of the developer and of the manipulation in development would prove the most desirable remedy. It is probable that a little longer keeping will make the collodions perfect.] "Best Means to reflect Light for the Opaque Side of Interior of Studio.—I find great difficulty in getting the shadows on my sitters softened to suit general taste and wish to know whether any other article than a white calico screen has been tried with success. I have heard of screens covered with tinfoil: have such been found good? I may say that it is quite possible. My side-light—northern aspect—does not extend far enough from the sitter, and so the light will come in a sharper angle, and so have the greater tendency to make deep shadows on the face. My total length of side-light is twelve feet, the windows coming close up to background. I have then about three feet of this screened off, just beside the side of the sitter, and leaving about eighteen inches of clear glass next the background, to give the effect of light streaming in at open window side slip,

so that by this arrangement I have only about six or seven feet in length of side-light in advance of the sitter at north side. The south side is quite opaque, but I have a top window in advance of sitter on south side, to try to soften shadows by that plan, and this I can do by leaving it completely uncovered when I have no sun; only being obliged to screen off completely in sunny days. I get the heavy shadows again." [Some operators have found screens covered with tinfoil answer well for reflecting purposes. It is probable that if our correspondent works cross-corner-wise of his room, turning his sitter so that he slightly faces the light, he will get rid of heavy shadows. See diagram recently given in Mr. Robinson's article on Pictorial Effect. If the top-light answer the purpose when there is no sun, it will also answer when the sun shines if the light pass through a thin blind of tracing-cloth or tracing-paper.]

GEO. SIMMONS.—The printing in the card sent is not at all bad. Possibly a very slight degree deeper printed and warmer toning would please our taste more. 2. You cannot do better than follow the instructions for printing given by Mr. Bovey in his recent articles, or as briefly given in his article in our last YEAR-BOOK. 3. Gas-light will not injure sensitive paper, unless it be very unnecessarily prolonged in exposure to such light. 4. Good paper for card pictures may be prepared with various chlorides. Chloride of ammonium, or a mixture of that and chloride of barium, will give very good results.

LITHO.—There is no difficulty in photo-lithography which may not, by an intelligent photographer, be overcome with care and perseverance. It will require much practice and a careful observation of instructions. The best instructions will be found in an article in our YEAR-BOOK for 1867 by Mr. Butter, a skilful practical photo-lithographer; and in a series of articles which have recently appeared in our pages (commencing June 12th), written by Lieut. Waterhouse, who has carefully worked out the processes he has described. Photo-lithography would be scarcely well suited for reductions so small as that you enclose; any lithographic process will scarcely do justice to such delicate lines.

UNIQUE.—Various formulae for toning and fixing in one bath have been published. A recent formula by Dr. Liesegang, which gives very fine results, stands as follows:—

Water	2 ounces
Sulphocyanide of ammonium	50 grains
Hyposulphite of soda	240 "
Acetate of soda	15 "
Chloride of gold	1 "

Mix all but the chloride of gold, and, after mixture, dissolve the gold in a little water, and add to the solution. Bear in mind, however, that prints toned and fixed at one operation are more doubtful in their permanency than those fixed at a separate operation. 2. It is impossible to state the proportion of permanganate of potash necessary to oxidize the organic matter in a silver solution because the quantity of organic matter is uncertain. You will find many details on the subject in our numbers for March last (6th, 13th, and 20th). A few drops of a 10-grain solution will generally be found sufficient. The solution will acquire a brown turbidity, which will finally precipitate, or may be filtered out. This precipitate consists of the organic matter and oxide of manganese.

AN AMATEUR.—The chief difficulty in rendering the paper perfectly transparent consists in its inequality of texture and in the difficulty of perfectly removing the sizing material employed. There are various modes of manufacturing tracing paper, each manufacturer employing his own method. Canada balsam dissolved in turpentine, with sometimes the admixture of poppy oil, almond oil, &c., are materials commonly used. Try almond oil alone. Remove the size from the paper with hot water; then soak it in the oil for some hours; drain, and hang up to dry.

C. A. M. W.—After the golden syrup solution has been applied, the plate is insensitive to light, or nearly so. It may be examined in dull light, but it will be safe not to expose it long, or to a brilliant light. The intensification may be conducted in a dull diffused light; but it is well to remember that as light aids the reduction of silver, too much of it may induce fog.

THOMAS STOTHARD.—The difficulty of dealing with blues and yellows in an illuminated window cannot be entirely overcome by photography. The only mode of dealing with the matter that we can suggest will be to manipulate both negative and print a little. Even with fully bromized collodion and full exposure, light through blue glass will act vigorously, and produce density in the negative, and light through orange glass will scarcely act at all, and will be rendered in the print by a dark, instead of a light luminous tint. 2. If we remember rightly, the use of sulphate of zinc in a developer was referred to in one of the letters of "Lux Graphicus." We will search, and, if necessary, repeat the formula. We are glad that you found carbolic acid in the bath useful.

PHOTO DEALER.—Have no fear; the new Sale of Poisons Act is not in operation; it does not come into force until the commencement of next year. The print from which you quote is wrong, as usual.

IGNORAMUS.—The winter session of the Photographic Society will open with an exhibition, as it did last year. It will be open to the contributions of all photographers. It will open on the 10th of November. Contributions should be sent to 9, Conduit Street, addressed to the Secretary of the Photographic Society, not later than November 9th.

W. J. A. G.—A red brick building, partly in shadow and partly in sunlight, is a trying subject for a wet plate, and still more so for a dry one, which, as a rule, is less sensitive to weak radiations than wet collodion. We can only advise you to give full exposure, and be patient in development. One of the greatest sources of failure with novices in dry plate work is impatience in development. Accustomed to the rapid development of wet plates, they are not prepared for the tardy appearance of detail in dry plates, and in attempting to force development they produce fog. We have had no failure with the Liverpool plates, and have usually given them from three to four times the exposure of wet plates upon a properly lighted landscape. Try again; follow instructions carefully, and work patiently.

STRIKE-A-LIGHT.—We tried the collodio-bromide process as described by Mr. Sayce soon after its introduction, with success. We used the preparation within a week after it was mixed. We cannot say from experience how long it will keep after mixing. Mr. Bolton, one of the originators of the process, is also a skilful worker of it, his results, which we have seen, being very excellent. As our own experience with the process is less than his, we fear that we cannot give you any better formula; but if you will state wherein your failure consists, we may be able to advise you. 2. There have been no especial results of the discovery at all, so far as we know.

F.—The writer who signs "Respiece Finem" is well known to the photographic world; but you must take his opinions on photography and art on their intrinsic merit. If he had made statements affecting the interests of individuals, it would have been necessary to substantiate them with his name: opinions on abstract questions may with propriety be stated anonymously. The writer in question is neither Mr. Robinson nor Mr. V. Blanchard. The "authority" you mention is, as usual, incorrect.

NEW SUBSCRIBER.—You do not state the intended dimensions of your studio, a somewhat necessary element in deciding as to the amount of glass. We will assume, however, that the size is about twenty-five feet long and twelve feet wide, and advise for such proportions; you can then modify as may be desirable. The proposed position of the studio is good. It will not be necessary to have any glass on the south side or roof. At the west end let about six feet of side and roof be opaque, and about ten or twelve feet side and roof be glazed, the side lights coming to within eighteen inches of the ground. Avoid having any windows in the east end. Let the walls, backgrounds, accessories, &c., be of a quiet grey tint.

STEREO.—You will see that we have alluded to the view you put of the Relief Fund in an article in the present number. We quite agree with you, that to attempt the thing and fail would be disastrous; and we quite agree that the initiatory steps must be taken by men of standing and credit, to afford the slightest chance of success. As to whether the profession is sufficiently numerous, or whether the time is ripe, are questions which require discussion. Let us have your views and arguments fully stated for publication, instead of in a letter for private perusal. The appeal for Mrs. Pearson did not appear in our literary columns because we are, as a rule, unwilling to trench upon the space belonging to our readers with any matter not properly relating to that department. It appeared gratuitously in the advertising columns because we had a better right to trench upon space the granting of which only involved a sacrifice on our own part. We saw the remark: a mean mind judges everything by its own standard.

"Pictorial Effect," "Noteworthy Studios," some Reviews, and other Articles in type, are again compelled to stand over until our next. Several Correspondents in our next.

Photographs Registered.

Mr. W. H. PRESTWICH, Reading,
Seven Photographs of Rev. J. Langley.

Mr. APPLEVARD, Brighouse,
Three Photographs of Kirkees Hall and Gardens.

Miss E. COLLINS, Chelsea,
Photograph from India-ink Drawing of Beau-Desert.

Mr. J. STUART, Glasgow,
Photograph of Kelvin Grove Park.

Mr. R. CRAWSHAW, Cyfarthfa Castle, Merthyr,
Two Photographs of Bishop of St. David's.

Mr. H. J. TAPHOUSE, Barrow-in-Furness,
Photograph of J. Ramsden, Esq.
Two Photographs of Marquis of Hartington.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
The Forthcoming Exhibition of the Photographic Society.....	517
Alcohol in Developing and Intensifying Solutions	517
New Method of Masking Prints.....	518
Critical Notices	518
Photography in Egypt.....	521
Pictorial Effect in Photography. By H. P. Robinson.....	521
Printing Transparencies on Dry Plates without Cutting the Negatives	523
Sensitive Development Printing Process	523

	PAGE
Photographic Printing in Silver, Theoretical and Practical. By W. T. Bovey	524
Correspondence—Salting Formulae of Albuminized Paper—Dis- tortion and Perspective—Mr. Fry's Mode of Masking— The Enamels at the Cornwall Polytechnic Exhibition— Status of Photographers	525
Talk in the Studio	527
To Correspondents.....	528
Photographs Registered	528

THE FORTHCOMING EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

As our readers are aware, the coming session of the London Photographic Society will be opened with an exhibition of photographs, to be held in the usual meeting room of the Society, at the Architectural Gallery, 9, Conduit Street, Regent Street. The exhibition will be opened on the evening of Tuesday, November 10th, at half-past seven o'clock, when members and their friends, and exhibitors, are invited to a similar social reunion to that which passed off so pleasantly last year.

The original intention in regard to last year's exhibition merely comprehended the idea of devoting the opening evening of the session to a display of photographs. The number and excellence of the contributions were, however, so great that it was resolved by the council to keep the exhibition open for a week. The success of last year has suggested a repetition of the experiment with a little more pre-arrangement. On this occasion the exhibition will be opened with a distinct understanding at the outset that it will continue open for a week, during which time it will remain open to the public gratuitously.

Photographers at large are invited to contribute, members of the Society and non-members alike, so as to bring together a fair and creditable representation of the present state of English photography. Members of the Society will doubtless feel themselves in some sort bound to aid by their contributions the success of such a display. But photographers at large have an interest in such an endeavour not less than the members of the Society. The value of exhibitions as furnishing at once landmarks of past progress and aids and incentives to renewed effort scarcely needs enforcing. To amateurs, few things afford more pleasure than the opportunity of examining the various developments of the art, and especially the results obtained by fellow-devotees to some special branch to which they themselves have given attention. To professional photographers, the opportunity of examining a collection of pictures fairly representing the characteristics and degrees of excellence attained by their professional compeers must be a matter of commercial value, as well as personal interest. And as a large section of the public interested in the progress of science and art will visit this exhibition, all concerned in the reputation of photography should aid, by contributing the best examples they can, to produce a worthy exhibition.

Where it is convenient to the photographer, it is of course advisable to send pictures in frames; but for the accommodation of those to whom the trouble and expense of framing a large number of pictures might prove an obstacle, unframed pictures will be received for exhibition; but it will be understood that the mounts in such cases will suffer a

little in the process of pinning to the wall and by exposure for a week without the protection of glass. Collections of prints in portfolios and albums will also form an agreeable addition to the contributions.

Apparatus of various kinds will be admitted to the exhibition, and we shall hope to see a good display of the most recent improvements in the mechanical and optical appliances of photography.

Contributions should be delivered at No. 9, Conduit Street, addressed to the Secretary of the Photographic Society, not later than Monday, November 9th. It is desirable that every frame or separate picture should have the name, and number of contributions, of the exhibitor at the back. On the front of each, the name of the exhibitor, the name of the subject, and the process employed, should be written for the benefit of visitors, because, in the absence of a catalogue, this will be the only mode in which information on the points indicated can be conveyed. Contributors should also send a list of their contributions, with the name of each subject forwarded for exhibition, addressed to the Secretary of the Photographic Society, at the Gallery in Conduit Street.

The meeting will, as on the last occasion, be of the character of a conversation, without the necessary formality of evening dress, the aim being to secure a social and agreeable reunion of all interested in the exhibition. All members, and all contributors who are not members, are invited to attend and to bring their friends with them, ladies being especially invited. No cards of invitation will be issued, the announcement in the last number of the Society's Journal, and the invitation, which we are authorized to repeat, being, it is believed, sufficient to bring together a large number of those interested in such a display of photographs as it is confidently hoped will be exhibited on this occasion.

We see no reason to doubt that the great success of last year will be repeated next month. We should be glad to see it surpassed; and we earnestly invite all our readers, who possibly can, to contribute themselves, and induce their friends to do so as well, so as to bring together such a display as will at once gratify all photographers with the illustrations of present excellence, and stimulate them to greater triumphs.

ALCOHOL IN DEVELOPING AND INTENSIFYING SOLUTIONS.

An incidental remark in a communication by Mr. Russell Manners Gordon to our YEAR-BOOK of 1866 contained a suggestion the importance of which in practice cannot be over-rated. A recent allusion to this suggestion in one of our own articles has brought several enquiries which induce us to think that simple and self-evident as the idea is, it is

not as familiar to photographers generally as it ought to be, and that it is worth briefly re-stating.

The object of adding alcohol to the developing solution is, as every photographer knows, not to produce any chemical effect or to aid in developing, but to harmonize, as nearly as possible, the physical condition of the developing solution with that of the free nitrate of silver on the plate, so that the former may flow evenly over the film without forming greasy-looking lines, which arise when the two solutions are not in the same condition. The suggestion to which we have referred is simply to carry out the practice, employed with developers, to all the solutions employed in developing or intensifying, a thing which, obvious as it may appear, is by no means commonly done. Whatever quantity of alcohol is added to the ordinary developer should be also added to the intensifying solution, and to the silver solution kept for adding to the intensifying solution. We are here assuming that the intensifying is effected, as it now most commonly is, by means of an iron solution. It will be seen in such case that the application of the developer can be followed by the application of the iron intensifier, or that of the silver solution, without either washing between each application, or running any risk of the production of stains from the repulsion or imperfect mixture of solutions containing different proportions of alcohol. The convenience in operating which arises from being able to apply one solution after another without washing and without risk will be readily appreciated by practical operators who have not hitherto tried such a simple aid to clean and convenient working.

NEW METHOD OF MASKING PRINTS.

SOME correspondence which has reached us, on the subject of the method of masking prints employed by Mr. Fry, which we described in our last, suggests that we had not made the precise purpose and scope of the operation so clear as we intended; and it is pointed out that unless used with judgment, the employment of a transparent positive as a mask might be made to produce, instead of improvement, a negation of all gradation and modelling.

This is perfectly true: but we meant it to be used in the right way and with judgment, although it seems we did not point out the limitations of its use with sufficient detail and iteration. Let us glance, therefore, at the matter a little further. One of our correspondents points out, very truly, that the thinnest or most transparent part of the mask proposed will be the points of highest light, and that the lights in a print exposed under such a mask will be the first portions upon which light will act, and that degraded lights instead of increased detail will be the result. As there is something ingeniously erroneous in the argument of "R. F.," it may be worth while, before correcting him, to make his position quite clear by an illustration. He states that the first effect upon a print of using a transparent positive as a mask will be a degradation of the high lights, and then the gradual impress of gradation, but that the gradation will be in the wrong direction, darker towards the lights, and lighter towards the shadows. Thus, if we print an image of a sphere from a negative, assuming it to have been produced in an ordinary glass room, we shall have a spot of light near the top, gradually merging into deeper shade as the surface of the sphere recedes from the light, the under surface being only relieved from absolute blackness by reflected light. If we then take a transparency from the same negative, and print an image on paper from this transparency, we obtain an image exactly the reverse of that printed from the negative. Instead of a light near the top, we have in its place the intensest black, gradually merging into white as the surface of the sphere recedes, producing, instead of the effect of relief, the effect of hollowness or intaglio. Our correspondent then points out that as this is the kind of image which a print from the mask would present, it will produce just such an effect when superposed

on the print, limited only in degree by the time of exposure under such a mask.

As we have said, this assumption is so ingeniously wrong that it was worth while to state it fully before correcting it. All that "R. F." has stated would undoubtedly result if the mask were used as he is assuming it would be; that is, upon the print after it is removed from the pressure-frame. But it is not, under any circumstances, to be so used. Let it be distinctly understood that it is to be used as masks usually are—practically to modify the character of the negative during the progress, or part of the progress, of printing. The negative is assumed to be too hard; to possess too much contrast; to allow some portion to become too deeply printed, so as to bury detail in the shadows before the details in the lights are printed through. This mask will practically reduce the contrast, retarding the printing of the shadows without impeding the printing of the lights, and so bringing about the balance necessary to produce harmony. There is no danger of the lights being degraded, because they are at all times protected by the dense negative; and there is no danger of inversion of gradation, as however the mask may modify the passage of light, that light must always pass through the negative before it reaches the print. As we said in a former article, the mask may be worked upon to any extent the photographer may desire, in order to produce special effects; but in order to correct the effect of an over-dense negative, it merely requires to be a good transparent positive from such negative.

Mr. Rejlander, in a private letter, makes a capital suggestion in connection with this subject, one which would be valuable in dealing with subjects in which the inherent contrast is too great to receive full justice from photography. He suggests that if the collodion film could be safely transferred from the glass, a negative giving fine results might be formed by the superposition of two films: one thin and soft, with abundance of delicate detail and half-tone, and the other with more contrast, doing full justice to the more vigorous lights. As there is really no difficulty in removing the collodion film from the glass, after a very little practice, either by the method described by Mr. Woodbury or others, the suggestion of Mr. Rejlander might easily be put into operation, and some harmonious pictures produced from difficult subjects.

Critical Notices.

ON THE RETOUCHING OF PHOTOGRAPHS; A Manual of Instruction in the Perfection of Negative and Positive Photographs, and in Colouring the same with Water, Aniline, and Oil Pigments. By JOHANNES GRASSHOFF. (Berlin: Louis Gerschel).

In a compact little volume of eighty pages, M. Grasshoff gives us very clear and precise directions on the subject of improving and beautifying photographs. The subject is one upon which the author is well qualified to write, and the simple unaffected language in which his ideas are conveyed to the reader render his remarks easily intelligible to the novice, and awaken a spirit of trust and confidence in his teaching. It is essentially a practical book; and, in the preface, M. Grasshoff informs us that he has, as far as possible, eschewed all theoretical dogmas, and confined himself to the description of methods which have stood the test of many years. He pre-supposes nothing further than a slight elementary knowledge on the part of the student, either in regard to manipulation with the camera, or with the brush; but remarks that, as a natural consequence, in order to produce perfect results, some skill is necessary on the part of the operator.

The volume is divided into eight chapters, treating respectively of the following subjects:—Retouching on the original; retouching on the negative; retouching of ordin-

any photographs upon matt paper with black pigments; retouching of albuminized prints with black pigments; colouring of photographs in ordinary water colour; colouring with aniline water colours; varnishing of photographs; and colouring prints in oil. All the directions given bear particular reference to portrait photography.

In regard to the retouching of the original—or, in other words, the treatment of the sitter—the author urgently recommends a judicious employment of powder and puff for removing summer freckles and spots, and for toning down hair and beards of two fiery a colour. The photographer is advised to put forward his utmost powers of persuasion, and use any amount of Ciceronian eloquence he may possess, to effect this method of retouching the original whenever the same is absolutely required, but he is warned not to overstep the bounds of necessity, as, in most cases, a mere thought of starch powder lightly applied by means of a swan's-down puff is amply sufficient to bring about the desired alteration. Any colouring of the cheeks or lips with a red pigment M. Grasshoff holds to be quite unnecessary.

The chapter devoted to retouching the negative is one of the most interesting and instructive in the book, and we therefore trust to be able to place the same before our readers in its entirety at an early opportunity, the subject being one which has of late received considerable attention by the photographic world. The fact that M. Grasshoff has been one of the most successful operators in this branch of photographic manipulation is sufficient guarantee for the practicability and efficiency of the methods he recommends.

With regard to the retouching of photographs upon matt paper with black pigments, the author makes the following cautionary remarks:—

"In the early days of photography very little attention was paid to the quality and durability of the pigments used for retouching, even when the pictures operated upon were to be continually exposed to the effects of air and light, as in the case of exhibition and show prints. Thus, when an elaborately retouched picture covered with a pigment of inferior value began to lose its originally beautiful tone, and to change colour, assuming an ugly bluish-green tint, the cry was at once raised that photographs were of a very perishable nature, and that no confidence could be placed in their permanence. The character of the photograph was thus impugned instead of the genuineness of the colouring matter with which it was covered.

"To prevent a mishap of this kind I employed myself for some time in looking about for pigments, and particularly for a good red, in the permanent character of which confidence might be placed; my selection falling eventually upon Vandyck brown, whose fiery red tint was found to impart the requisite tone and to give excellent results. By adopting this brown I was enabled to dispense altogether with the use of carmine, neutral tint, and similar colours for mixture with the black Indian ink."

The preparation of the composition to be used for retouching in black is thus described: "A cake of Indian ink is rubbed in a small porcelain dish with water until a solution of thick consistence is obtained; the ink should be of first-rate quality, as upon this depends the facility with which it is afterwards manipulated. As the Indian ink possesses a very dark brown tint, a little blue (either Prussian, Paris, or Pinkert) is added; and in order again to correct the bluish tint which the ink may thus acquire, a small quantity of Vandyck brown is put in. The colours should be thoroughly mixed together by means of a brush, further quantities of blue or red being added until the tone of the picture is well imitated, a little of the compound being applied by a brush to white paper and allowed to dry, in order to make the comparison. When a suitable pigment has been thus obtained, three or four lighter tints of the same colour are mixed in several porcelain shells, by taking small quantities of the thick

solution and diluting them with different volumes of water; thus the painter is provided with every gradation of tint necessary for his work."

M. Grasshoff recommends the application of several coatings of a light tint, rather than one of a dark nature, whenever great depth of shadow is required, and states that, inasmuch as the Indian ink always soaks well into the paper, a former application of the pigment is never injured by subsequent elaboration with the brush. It is for this reason that Indian ink is so well adapted to photographic retouching. To give the retouched picture a finished appearance, the author suggests a vigorous brushing of its surface with a clean, dry clothes-brush. If the print has been only slightly worked upon, it may, after brushing, be polished with a compound consisting of equal parts of white wax and good oil of turpentine, or oil of lavender, melted together.

The fourth chapter, devoted to the retouching of albuminized prints with black pigments, contains but little novelty. The pigment to be employed is prepared in a similar manner to that described in the previous chapter; but, inasmuch as more brilliancy is required, a sufficient quantity of a thick solution of gum is added to effect this purpose. Glycerine or sugar mixed with the pigment enables it to be the more easily applied to the albuminized surface, which should also be moistened with saliva, or a dilute solution of white of egg, to facilitate manipulation.

Painting photographs in ordinary water colours forms the subject of the next chapter, which bears especial reference to the manipulation of albuminized prints of small dimensions. As this has always been a subject of great interest, owing to the large number of coloured cartes-de-visites which are sold, we intend on a future occasion to place this chapter likewise before our readers, without curtailing any of M. Grasshoff's valuable remarks upon the subject.

The employment of aniline colours, recently brought into commerce by Dr. Jacobsen, of Berlin, is next discussed. The opinions of those who have used these colours, says M. Grasshoff, are very divided, as by some they have received unqualified praise, while by others their qualities have been greatly decried. The author proclaims himself in their favour, and attributes to ignorance and inexperience any cause of failure. Their manipulation is not different from other water colours, but care must be taken never to overstep the outlines in the picture, as the perfect removal of extraneous paint is extremely difficult, if not altogether impossible. Another drawback to the use of aniline colours is the fact that some of the tints are wanting, and in this case M. Grasshoff suggests their being eked out with ordinary water colours.

In Chapter 7 M. Grasshoff treats of the varnishing of photographs, always recommending a double application of a preserving fluid. A dilute normal collodion containing from two to three per cent. of gun-cotton is poured over the picture and allowed to dry. Defects may now be remedied, or improvements made upon the collodion film, and afterwards a sandrac varnish is applied to the print by means of a large and broad camel's-hair brush. This mode of varnishing is best adapted to prints upon albuminized paper; but matt pictures may also be treated in this manner, provided a thicker and stronger varnish is used. In general, the polishing of pictures of the latter description with white wax is preferable. Photographs painted in aniline colours must not be coated with a spirit varnish, as these pigments are soluble in alcohol.

The last division of this little book treats of the painting of photographs in oil colours. The author goes very fully into this method of colouring, detailing the manner of selecting and treating the print before colouring, and of laying on the various pigments. He also gives directions for the preparation of canvas upon which photographs may be printed, to serve as designs for oil paintings. A list of the different pigments required is quoted, and in-

structions as to their management imparted, as far as it is possible in so small a space; the finishing and varnishing of the pictures is also touched upon.

As M. Grasshoff rightly remarks at the outset, he does not profess to teach anybody to paint solely with the help of his book, but that, in all the manipulations he describes, some amount of skill is necessary on the part of the operator. The author's object in publishing his remarks is to simplify the process as much as possible, so as to enable photographers and amateurs of ordinary ability to produce coloured pictures in the easiest and best manner, and to understand the principles upon which they work. That M. Grasshoff has been successful in doing this there can be little doubt; and we feel sure that many aspirants will be greatly aided in their work by a reference to the volume now before us. We hope the time may not be far distant when the author will again resume his pen to tell us something of photographic backgrounds and accessories, a subject upon which his remarks would be equally valuable with those at present under discussion.

A TREATISE ON OPTICS; or, Light and Sight, Theoretically and Practically Treated, with the Application to Fine Art and Industrial Pursuits. By E. NUGENT, C.E. (London: Virtue and Co.)

THIS is a comprehensive and popular treatise on optics, which, in the dearth of such works, will be welcomed by the student. That an elementary work intended for a text-book for schools and colleges should be a compilation from recognized authorities was not unnatural, and accordingly we find that Sir David Brewster's work on optics has furnished the basis of the present work, and that the author has fallen into an error, only too common, of omitting to mention the authorities on whose pages he has drawn. Nevertheless, the work is a very valuable one, containing much information on photographic optics and the apparatus connected therewith, the information on these subjects being brought to a later date, and being therefore fuller, than in any other work on the subject. The work is well printed and copiously illustrated, and it contains that valuable but rare adjunct, a very complete index. Altogether, we can recommend this volume to those of our readers who may desire to know something of the principles which underlie their art. The work is clearly written and carefully arranged, and is at once comprehensive and popular.

PHOTO-MICROGRAPHS Executed for the Army Medical Museum, United States.

WE have been favoured by the Surgeon-General of the United States Army with a series of photo-micrographs executed by Brevet-Major Curtis, Assistant-Surgeon of the Army. Several of these photographs have become familiar to English photographers by the examples sent over to this country by Col. Woodward, which have been exhibited at meetings of some of the societies. Criticism on such work is altogether superfluous; it appears to be simply perfect, both in definition and brilliancy. We have examples of amplification varying from 30 diameters to 2,100 diameters with perfectly satisfactory definition. A Podura scale, for instance, taken with Powell and Lealand's 1-50th inch objective, with the latter amount of enlargement, is marvellously well defined. The same test-object, however, taken with a 1-25th inch objective by the same maker, magnified 756 diameters, is, in our estimation, preferable. The following extract from a description of the operations in producing these enlargements, contributed by Col. Woodward to our Philadelphia contemporary, will interest many of our readers:—

The essential parts of the process are, the use of object-glasses corrected so as to bring the chemical rays to a focus, and illumination by violet light. The steps are, briefly, as follows:—

The microscope is used in a dark room, the windows of which face to the south. Outside of one of these windows is a shelf, on which stands a Silbermann's heliostat, so arranged as to reflect the direct rays of the sun upon the mirror of the microscope, which is fixed on an arm outside of the window, and, in its turn, reflects the sunlight through a short tube in the shutter. The microscope is placed at the inner extremity of this tube in a horizontal position, while at the outer end hangs a plate-glass cell, filled with a saturated solution of ammonio-sulphate of copper. Through this solution the sunlight must pass to enter the tube, and in so doing all but the violet ray is absorbed. Two steel rods, attached to the mirror, permit it to be adjusted without opening the window, and a black velvet hood thrown around the stage of the microscope prevents any leakage of light into the room from the space between the condenser and the objective of the instrument. With high powers, an ordinary achromatic condenser is used; or, in some cases, a pair of simple plano-convex lenses, with a large central stop, may be advantageously substituted, to give greater obliquity to the illuminating pencil. Objectives properly corrected for illumination with violet light have been manufactured for the Museum by Mr. W. Wales, of Fort Lee, N. J., who has produced a three-inch, four-tenths, one-fifth, and one-eighth, the quality of which, in my opinion, is all that can be desired. The plate-holder, properly centred, slides on a horizontal walnut frame, by which it is held perpendicular to the axis of the microscope, and can be clamped at any distance not exceeding nine feet from the stage. By the side of this frame is a round rod, on the extremity of which, next to the microscope, is a grooved wheel. The milled head of the fine adjustment of the microscope is also grooved, and a silk cord over the two enables the operator to focus the microscope by means of the rod, no matter how far from the instrument the plate-holder may be.

To arrange the illumination, position of the object, &c., the operator stands by the microscope, puts in an eye-piece, and focusses in the usual way, adjusting the mirror by means of the steel rods. The violet light is readily borne by the eye, even when the whole power of the sun is employed in the illumination. This adjustment completed, the eye-piece is withdrawn, and, going to the plate-holder, the final adjustment is made by turning the rod. In this final focussing, the object is viewed with a focussing glass on a piece of plate-glass held in the plate-holder. The sensitive plate is then exposed in the usual way, the time required being from less than a second to twenty minutes, according to the power employed.

For low powers, the objective alone is relied on to give the necessary size. To obtain the highest powers, however, an achromatic concave is placed at the upper extremity of the microscope body. The one now employed gives a perfectly flat field, and increases the number of diameters between six and seven times. This concave is about half an inch in transverse diameter, and has an angle of aperture of 28°.

Many objects—as, for example, some of the tissues, certain diatoms, &c.—present interference lines when illuminated with a powerful pencil of parallel rays, and in order to prevent this false appearance, it is necessary to interpose a piece of ground glass in the solar pencil to disperse the light: in this case the time of exposure necessary is, of course, much increased.

By these contrivances we have been enabled to produce pictures of the utmost sharpness, and perfectly satisfactory in every other respect, with powers up to 2,500 diameters; and these pictures bear a further enlargement of from six to eight diameters in a copying camera. We have thus obtained excellent pictures with no less than 19,000 diameters.

If the foregoing points are duly attended to, it matters comparatively little which of the very many excellent photographic processes in use for ordinary work is employed. As to collodion, many different samples have been used with good results—among others, for example, one containing two and a half grains each of the iodide of ammonium, the iodide of cadmium, and the bromide of ammonium, to the ounce of collodion. With the highest powers, a collodion containing two grains of bromide and five of the iodide of magnesium to the ounce has been found advantageous, the resulting nitrate of magnesia preventing the plate from drying during the long exposure necessary. The nitrate bath is used of the strength of forty grains to the ounce, and is acidulated with nitric acid. We use the ordinary iron developer, restrained by the gelatine solution, on the plan proposed by Brevet-Major W. Thomson in a recent number of your journal. The picture is fixed with hyposulphite of soda or cyanide of potassium, and afterwards intensified with iodide of mercury dissolved in a solution of iodide of potassium, and, when necessary, still further with Schlippe's salt. Great intensity is especially required in pictures of the diatomacea, and other lined objects. The negative is finally varnished, and prints taken on albumen-paper in the usual way. I send you samples of these prints. It is to be remarked, however, that for the Museum we prefer transparent positives on glass, mounted before a piece of ground-glass. A fac-simile of the field of the microscope is thus obtained. I should take plea-

sure in showing any of your readers who may visit the museum the splendid series of specimens prepared by this method.

It may be remarked that, with the very highest powers—such as, for example, the new Powell and Lealand's one-fiftieth objective, one of which is in the possession of the Museum—the correction of the objective, to suit the index of refraction of the violet ray, is so small as to be practically unimportant. At least, by illuminating this lens with monochromatic light, we have obtained with it excellent photographs, one of which I send you. This remark, however, does not apply to the one-eighth nor to any lower power. I have not yet experimented with the one-twelfth or one-sixteenth, but believe, also, that with these glasses the special correction will be found indispensable to the best results. I may also say that with the one-eighth and the amplifier we have obtained photographs with magnifying powers as great as we have been able to obtain from the one-fiftieth. Comparative pictures taken from the same object give the preference, in some particulars, to the one-fiftieth; in some, to the one-eighth and amplifier.

The process I have above sketched is employed in the Museum in preparing the pathological illustrations for the medical history of the war, and diatoms, &c., have been employed by us simply as test-objects.

PHOTOGRAPHY IN EGYPT.

As we have before stated, the German photographic expedition despatched to Aden to record the solar eclipse has received instructions to pursue some photographic investigations in Upper Egypt, and obtain records of the various ancient relics and inscriptions which abound there. Our friend, Dr. Vogel, will communicate to these pages notes of matters of interest to photographers occurring during his Egyptian tour. In the meantime we reproduce his first letter, addressed to Dr. Jacobsen, who edits the *Mittheilungen* during Dr. Vogel's absence:—

On the Nile, North of Minieh.

In my last letter I communicated to you the fortunate issue of our photographic observations of the eclipse of the sun; since that time scarcely four weeks have gone by, and in the meanwhile I have travelled by the Suez canal from Suez to Port Said, in the Mediterranean, ascended the Pyramids, spent eight days in the deserts of Sahara, and now am sailing on the Nile, towards Upper Egypt, for the purpose of fulfilling a new scientific engagement, which it appears was part of the mission of our expedition after the principal object, photographing the eclipse, should have been completed.

The first intimation of the expedition to Upper Egypt reached us at Aden. In Cairo we found the leader of the expedition, Dr. Dumichen, waiting us. He had a barque already furnished to take us up the Nile, a splendid supply of chemicals from Berlin, and a stock of provisions purchased; so that after a very short sojourn we were enabled to proceed.

Our new duty was to photograph important historical inscriptions and sculptures on the Egyptian temples and tombs. For this purpose we were provided with a considerable quantity of magnesium and a magnesium lamp, to work in the mausoleums. Further, Dr. Dumichen had brought with him a gigantic tripod, twelve feet high, for our camera, together with the ladders belonging to it, to enable us to photograph correctly the higher friezes and writings. This tripod admits of the camera being placed almost perpendicular, so as to take drawings on the ceilings, &c.

First, we proceeded to Sahara. Here lies the field of the dead and the old town of Memphis, to which also belong the great pyramids. Here, in the sands of the desert, you find thousands and tens of thousands of tombs filled with earth. The ground is covered with potsherds of earthenware, the remains of sarcophagi and bones, the desert wind driving the tattered linen shreds of mummies over the waste and desolate plain.

The director of the Egyptian Museums in Cairo, and principal Inspector of all that is untombed in Egypt, acted as our convoy, and showed us many interesting tombs which he had discovered and laid open to view. Some of them formed noble courts roofed and columned; others simple chambers, with numerous bold reliefs on the walls. The whole of the rooms were half dark, being only lighted through small openings to be found in the ceilings.

The photographing of these reliefs was our first task, and we had to deal not only with the difficulty of defective light, but with that of their exceedingly short distance from us. On this account our first photograph was taken through the employment of the magnesium light, but we were only able to produce a few of the heads of portraits. Naturally, under these circumstances, very little could be done at a time, and in order to produce the picture of a long wall many photographs had to be taken. In the lighter tombs we photographed by daylight, and brought out the dark corners through reflected solar light, which we threw into the dark

parts by means of mirrors. In order to avoid faults in the lighting, we kept the mirrors continually working in rotation. Many of the dark places were photographed by using both the daylight and the magnesium light at the same time.

Besides these difficulties, when working in the desert, we had many other troubles to encounter. The wind perpetually blowing endangered our tent, and threw the fine sand upon our prepared plates. The exceeding dryness of the wind caused defects, and the muddy water of the Nile, for washing and rinsing, rendered any clean work most uncommon with us. We were best off when we could make our preparations in one of the tombs. For instance, we made use of the tomb of a prime minister of one of the Pharaohs, Ti—to judge from his heroic deeds, recounted on the wall, a sort of ancient Egyptian Bismarck. In his lifetime he certainly never could have dreamt that 4,000 years afterwards his tomb would be used as a photographic dark room.

In indifferently lighted rooms the Steinheil applanatic objective proved itself to be the best for photographing large surfaces. We were furnished with a complete supply of the different objectives, but none, with an equally large aperture, gave so even a picture as Steinheil's.

The most interesting part of the field of the dead is the Serapeum. This consists of subterranean catacombs executed in the rocks, in which are the colossal coffins of granite of the sacred bull Apis. M. Mariette had these mighty chambers lighted, so that we could behold at one view their magnificent dimensions. The size of the coffins may be imagined from the fact that we, eight men, found room at one table, not merely sitting, but standing also. The excessively heavy granite covers of these coffins are lifted aside in a body, and their contents removed. Diggers for treasure had rummaged out not only these, but almost every other tomb, long before European Egyptologists came into this country.

We tried at the end of our sojourn in the desert to photograph such an Apis-sarcophagus in its cavern with the aid of magnesium wire and a Dallmeyer portrait lens, and obtained, at the expense of eight metres of magnesium wire, a successful picture.

After encamping for six days in the desert, we got back to our barque. Our photographic implements followed us, partly on camels and partly on the heads of the natives.

On the 12th September we again set sail, and steered for Denderah. The first day we made seventy miles with a strong north wind, and had already begun to entertain hopes of soon reaching our destination, when, all of a sudden, our boat got aground and stuck fast at five o'clock in the morning. Vain were the exertions of the sailors to get her afloat. They called upon Mahommed, his wife, mother, and grandmother, shrieking to escape, but all to no purpose. After two hours' continued efforts, twelve men were fetched in a small boat from the nearest village; these, however, could not manage to float our barque. Now our situation became critical, and nothing remained except for our dragoman to be sent up the river to the nearest town to bring another vessel or a steamboat for our salvage. We thus spent twenty-four uncomfortable hours in the middle of the Nile. Fortunately we had been strongly recommended to the authorities of the country through our Consul. The Mushir of the place to whom our dragoman applied gave immediate orders for a hundred men to be sent off to float our barque, in which they succeeded.

We sailed again with a fresh wind, which continued until the following night. From that time the favourable north wind ceased, and now we are crawling slowly along; sometimes, indeed, not moving at all.

This dependence upon the whim of the wind, together with the danger of getting aground, is not the most agreeable part of a trip up the Nile. No man can with certainty dispose of his own time; and this affects me the more, as my duties for the middle of October call me back to Berlin.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XXXIX.

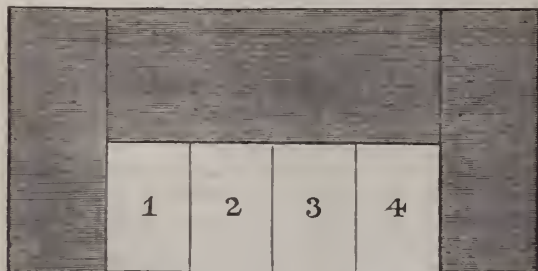
Why are photographers so afraid of shadow as their works indicate? It is seldom that a photographic portrait by an English artist is seen with more than sufficient shadow to ensure a certain amount of roundness and modelling in the head; and the effect of a head in shadow, or with the light coming from behind, is never found. On the Continent, photographers have seen the advantage of occasionally varying their effects. In Germany, especially, very beautiful things have been done with the face in shadow, and the

light, coming in from the back, skimming the side of the head. Very delicate and transparent effects, of which the engraving is a sample, are produced by this means. The subject entitled "The Sisters" is from an engraving published by Goupel; our illustration being a reduction, by

Mr. Fruwirth's process, of a wood engraving in an excellent little publication entitled the *Children's Friend*. It is not necessary to have a window in the background end of the studio to admit the light; it will be found quite sufficient and effective if a portion of the roof is used. A clearer



understanding of the method will be obtained from a reference to the diagram of the roof of the studio described in Chap. 30. The white spaces represent glass, covered with



white blinds, numbered 1, 2, 3, and 4. To produce the effect of light coming in from behind, the sitter is placed under No. 2, or rather nearer to the bar which divides 1 and 2. Blind No. 1 is pulled up, leaving clear glass, and blinds 2, 3, and

4 are pulled down; being made of white calico they admit a small amount of light, which allows a very soft shadow on the face. The camera is placed under No. 4, or any distance beyond necessary to the size of the picture required. The exposure necessary will be found to be very little longer than for a portrait lighted in the usual manner. If the negative be not over-intensified—at first it is difficult to believe that the broad mass of the face should be left so thin—the result will be exceedingly fine, luminous, broad, and without heaviness. I have left out of the account the side of the studio which should be blinded in the same proportion as the roof. If photographers could be persuaded to depart occasionally from the usual and monotonous manner of producing portraits which make their photographs so very "photographic" and unlike other works of art, they would soon find other variations in the mode of lighting which would create variety in their productions, and, in all probability, give their patrons a new interest in their works.

One of the evils which has prevailed amongst photographers, and a very natural one, is, that they have studied

too much from photographs. When they have seen a good effect in photography they have admired it and tried to imitate it; an aim laudable enough in itself, especially if very occasionally indulged; but which has, nevertheless, been carried out to such an extent as to produce in the mass of photographic portraits a dreary, common-place monotony, modifications of one or two or three leading styles being perpetuated *ad nauseam*.

I was consulted some years ago as to the wisdom of publishing a little work on posing and arranging, to consist chiefly of lithographic copies of actual photographs by the best masters, and was asked to undertake or superintend its preparation for the press. In the midst of the rapid demand for portraits, which allowed very little time for study or arrangement in the glass-room, such a work, it was deemed, would be eagerly sought after, and, I have no doubt, might have been a successful business speculation. It would, however, in my estimation, have been a mischievous book, and for the sake of photography I at once condemned the idea, and used my influence in preventing its issue. Photographs themselves were plentiful enough, and were too commonly imitated and copied; but to make copies of such things, and distribute for imitation, appeared to me worthy of all condemnation. It is true, there are a few masters of artistic effect in photography whose works might form valuable studies; but sufficient of the photographs themselves of these men are for the most part accessible where they are required for art study; and, as I have just said, photographic portraits are already too much alike, and modelled too much on one style. I have striven in these papers to impress upon the student the importance of avoiding direct imitation as a practice; and for suggestive studies I should recommend him to go outside of photography and examine the wealth of engraved pictures readily accessible. Many of the old mezzotint engravings to be picked up for a few pence each on London book stalls are invaluable. A habit of studying these would much improve the notions of chiaroscuro of most photographers, and teach them the value of shadow and the importance of securing transparency in shadow. The horror which photographers have had of shadow has been chiefly due, I believe, to the fear of blackness and unrelieved heaviness. A good mezzotint will show how much general depth of tone may be secured without blackness; it will show also how the distribution of half lights in the midst of shadow effects this. With the materials arranged to give light and shade in the photograph similar to that seen in a good mezzotint, the photographer will find that good lighting and full exposure will give him results not very far inferior to those in the engraved pictures.

PRINTING TRANSPARENCIES ON DRY PLATES WITHOUT CUTTING THE NEGATIVES.

THE production of transparencies is generally a favourite winter occupation with the photographer, and to the dry-plate worker it is an important point to be able to transpose the images without cutting the original negative. This can only be effected by means of a suitably arranged printing-frame requiring some ingenuity to contrive. One or two of these have already been described in our pages, and we now bring another under the notice of our readers, which seems admirable in its simplicity. The name of the Rev. J. Carter Browne, the inventor, will be recognized by many of our readers as that of an experienced and successful dry-plate man. He says:—

"I send you, according to your request in last week's NEWS, an account, with diagrams, of a frame I have contrived for printing transparencies on glass without cutting the negative. Let me briefly describe it.

"Fig. 1 represents the interior view: *a b c d* is the body of the frame, around which I have run an edging of wood three-eighths of an inch deep; in this the negative lies: *p p p p* is a

hold the exact size of one of the pictures to be printed, which, allowing for a margin of one-eighth of an inch above and below, and three-eighths at each end of the plate, leaves us three inches square: *e f g h k* is a flange of tin, tacked on to the lid,

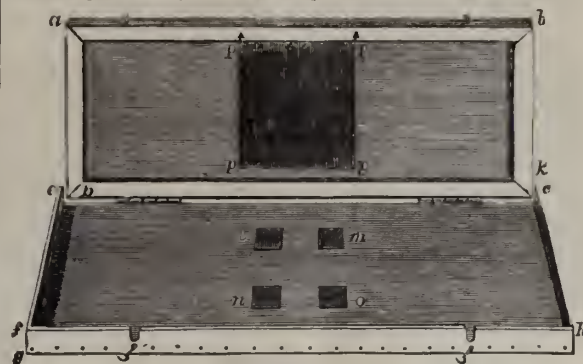


Fig. 1.

in order to prevent light finding its way between the body and lid of frame when closed; in this flange two slots are cut, to allow the two eyes at *t t* to come near enough to the two hooks to close the frame during printing.

"Fig. 2 represents the reverse of Fig. 1. On the lid *5 5 5 5* is the outline of a stereo plate, *6* denoting the extremity of the central line; this is in order to get the exact middle of the sensitive plate, so that I ensure against any double printing in the middle of my transparency: *1 2 3 4* are two fine pieces of

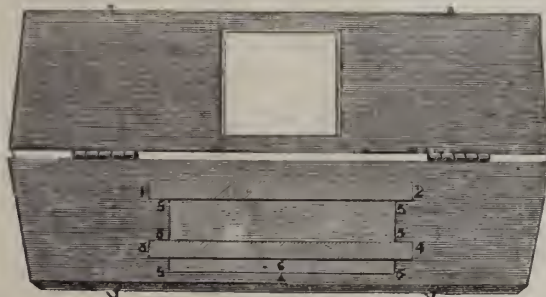


Fig. 2.

list, to prevent the plate being scratched when resting on the wood for measurement; the middle line is marked at its extremity by the point of a small arrow-head of paper gummed on the non-prepared side of the plate. During the printing this arrow-head is made to coincide at one time with the one, at the other time with the other, of the arrow marks in *a b* of fig. 1: *l m n r* are pads of india-rubber, which press the prepared plate tightly and equally to the negative when the frame is shut.

"I have tried many processes, and find that, next to the plain albumen, no process gives better tones or more delicacy than—

Tannin	...	...	...	...	15 grains
Sugar	...	...	...	...	1 lump
Aqua dest.	...	...	...	...	1 ounce

The exposure (in a northern light) at mid-day at this time of year, with sun shining, is (with a first-class negative—i.e., full of half-tone and not over-dense) six to eight inches; for other negatives in proportion to their class. Ordinary pyro and citric developer. It is by far the most satisfactory work at this time of year; seldom a failure, and always plates to prepare for the next day, and some to develop of the bygone day.

"I hope to have your critique on my transparencies not long hence, when I can get away to London.—I am, sir, yours faithfully,

"J. CARTER BROWNE, M.A.

"Horncastle Grammar School."

SENSITIVE DEVELOPMENT PRINTING PROCESS.

HERE STERNBERG communicates to the *Archiv* a highly sensitive development printing process, suitable for obtaining

enlargements with very short exposure. The paper is prepared as follows:—

Rain water	...	...	1 litre
Tapioca...	...	...	20 grammes
Iodide of potassium	...	...	10 "
Chloride of potassium...	...	...	40 "
Lemon juice	...	...	250 drops

The tapioca is first made into a paste by pounding in a small quantity of cold water, and the other materials are then added gradually, having been previously dissolved in the litre of rain water, which has been made to boil. It is kept heated during the adding of the tapioca, and until the liquid becomes clear. When cool, it is spread on the paper by means of two pieces of sponge, as in the preparation of arrowroot paper. If exposed to the atmosphere, this paper very quickly assumes a reddish hue, and mottled stains often show themselves on the surface; but these defects disappear when the sheets are sensitized.

The silver bath is composed of—

Rain water	...	...	1 litre
Nitrate of silver	...	...	60 to 100 grammes
Citric acid	...	...	5 "

The strength of this bath should be reduced if the negative be dense, and increased if the negative be soft.

The exposure must be prolonged until the outlines of the picture appear on the sensitive paper. It is then developed in a solution composed as follows:—

Rain water	...	...	4 ounces
Saturated solution of gallic acid	...	...	1 ounce

Immersed in this bath, the proof will there become gradually stronger, and will assume a sombre brown tone. It should be raised from time to time by the corners and examined. When it has attained sufficient strength it must be taken from the bath and made to float on a water bath, to prevent the gallic acid from sinking into the paper. After some minutes the sheets should be plunged into the water and well washed; it is then toned in an old gold bath, and finally it is fixed in the ordinary manner. After the mounting the proofs may be treated with cretaustic paste or varnished if brilliancy is required.

PHOTOGRAPHIC PRINTING IN SILVER, THEORETICAL AND PRACTICAL.

BY W. T. BOVEY.*

I HAVE frequently been asked by photographers of tender conscience, how I contrive to tide over the evil which, say they, must arise from the presence of free acid that is borne by the prints from the toning to the fixing solutions. I reply, "If any scruples are entertained, by all means add a little carbonate of soda to the preliminary washing water; it can do no harm. I doubt its power to effect good; it may, however, neutralize all the free acid conjured up by your imagination." In point of fact, it might be set down as a certainty that with the employment of the double salt of gold and sodium, together with an addition of free nitrate of silver to the bath, the toning solution is neutral; at least, with the most sensitive of litmus paper I have failed to detect acidity. Indeed, to add an acid in an appreciable quantity is to inaugurate disaster. In my own practice I simply remove the prints from the toning bath to a tray of water when they are ready for fixing, which last operation demands our next consideration.

Concerning the strength of hypo solution to be adopted for the proper fixation of silver prints, a diversity of opinion exists, and, as a natural sequence, each practitioner thinks his particular method the best. At a first glance over the matter it would appear a subject of small importance what strength of solution is adopted, as long as the unreduced

silver is dissolved out of the paper. Nor would it occasion any difference if the fixation of the picture was the only condition to be considered. But allow me to point to an hitherto unrecognized fact, that the formation of blisters is frequently caused by the adoption of a fixing solution of excessive density—in other words, by the employment of an over-dose of hyposulphite of soda. Considering the matter by the light of common sense, has it ever occurred to those who advocate such excessively strong baths that they overstep the bounds of economy by using an amount of hypo altogether disproportionate to the actual requirements, as the amount of the fixing salt they provide would afford hyposulphurous acid sufficient to combine with a thousand-fold more atoms of silver than the prints supply? I readily admit that to consider only atomic combinations would, under the circumstances, be worse than dangerous, as the resisting power of the albumen and paper has to be provided against. But I contend that at the extreme outside, 3 ounces of hypo to an imperial pint of water are ample for fixing any number of prints that quantity of water can comfortably contain.

With a paper weakly albuminized, no fear of blisters—even with the strongest of fixing solutions—need be entertained. It is when the albumen surface is raised above the paper by reason of its thickness—when the pores of the paper are sealed and rendered air-tight—it is then, and only then, blistering requires guarding against, and the avoidance of the evil depends on the density of the hypo solution, for the following reason. Up to the moment the prints leave the hypo bath, despite the handlings and washings the prints have been subjected to, they have failed to dislodge minute quantities of air imprisoned in the pores of the paper. Now with a slight coating of albumen, or when a coarse-textured paper is used, the outer portion of each pore remains open, so that, on immersing the prints into the final washing water, a quantity of air-bells forming on the surface of the paper go to prove that air is escaping; but when that air can find no outlet, it stands to reason that any application of considerable force must separate such portions of the albumen as have no firm hold on the paper. Physical science proves that such force exists—a force that finds in the conditions provided by an albumen surface a fitting field for action. The agent in question is allied to capillary action, and is known by the outlandish name, endosmose, which in commonplace English may be interpreted as meaning that when two liquids capable of admixture with each other are separated by any surmountable obstacle, the lighter fluid makes a rush to unite with the heavier. On consideration, it will be perceived how this force acts on an albumen print. The pores of the paper act as capillary tubes, through which the hypo solution enters as far as the confined air will admit it. So far there is no extra pressure; but when the prints are removed from the hypo to the washing water, this last makes a rush on the hypo, and the hypo solution gives an extra squeeze to the air, which, in its efforts to escape, dislodges the albumen, and blisters result. The remedy is obvious: reduce the strength of fixing solution, and you do something towards removing the difference of density between the hypo bath and water. I have followed up some interesting experiments in the direction here indicated, and I might say that I have produced blisters at will. Bear in mind I write of albumen surfaces, and on pure albumen surfaces only I experimented. As a wind-up to the subject of the fixing bath, I append the formulae I adopt:—

Pure hypo	...	...	2½ ounces
Water	...	...	1 imperial pint

Time of immersion, thick paper, quarter of an hour; thin paper, ten minutes.

And now for the final washings. What a deal of fuss has been made about this and that washing machine! What horror of feeling has been experienced when it has been told, of some careless brother, he puts his prints from the hypo bath direct into his washing trough! I freely confess myself

* Continued from p. 511.

guilty of like error, and believe myself much in the right. I drain the prints thoroughly from the hypo before immersing them in water; and my chief care is to have an abundance of water to start with, and I see that the water has made a move through the syphon before the prints are immersed. Depend on it, much of the fading we hear so much about often arises from excess of care in moving the prints from the fixing bath into a small dish, from that dish into a second, and so on. The waters employed in the earlier stage are converted into weak sulphurous compounds, which attack the whites of the prints, decomposition in latent form is set up, and a damp atmosphere, or other causes, will finish the destructive work, perhaps months subsequent to the formation of the germ. If any one would see what a dilute hypo solution can do, place a print or two in such a mixture for a few hours, when, ten to one, the print will go through all the stages of decay which silver prints are heirs to; or, at least, so their character is described by many. After all that has been said concerning the carbon printing process, until some process is discovered that enables the operator to work with his eyes open—such as silver printing admits of—silver printing will doubtless remain the favourite. By no other known process could Mr. Robinson's beautiful composition pictures be produced; by no other process can the sun be employed to remedy defects present in the negative.

Therefore, as silver printing is destined to enjoy a long lease of existence, let me, in conclusion, beg of my readers to do what they can to master all the difficulties connected with printing operations. I have faithfully offered reliable formulæ and instructions, in which I have examined existing theories, and offered others of my own. The formulæ I have recommended are all based on sound and economical principles, and the whole, if intelligently worked, yield unerring results. I here dismiss the subject of albumen printing, so far as theory and formulæ are concerned. My next paper I purpose devoting to the collodio-chloride process and printing by development. Until then, *Au revoir!*

ANSWERS TO CORRESPONDENTS.

B. A.—The addition of plain water to the bath is not, as you suppose, to replenish waste; it is intended to keep the solution in constant working order. The surplus solution so occasioned should be thrown away.

NEMO.—You are inclined to display some amount of irony. I have, as you are doubtless aware, studiously avoided puffing my own or any other person's goods. "Fair play" is the motto I adopt, believing there are many in the world more able and not less honest than myself.

S.—Add a little very weak chloride of lime solution to the toning bath, which will enable you to obtain the black tones you are sighing for.

Correspondence.

SALTING FORMULÆ OF ALBUMINIZED PAPER.

DEAR SIR,—A paragraph extracted from an American journal has recently been going the round of the London daily press, in which a satirical squib is set fizzing in honour of M. Dumas, the celebrated French novelist, whose announced visit to Yankee Land has inspired some witty journalist to improvise an anticipatory programme of the eminent Frenchman's probable performances, according to which, commencing with readings from his own works, M. Dumas will successively exhibit his versatile abilities as player, gastronomer, chemical demonstrator, velocipede driver; and the finale will consist of a grand distribution of photographs of the performer, accompanied with a packet of stuff for the cure of madness. My advice to M. Dumas would be: "For charity's sake present the first package of your madness eradicator to the writer of the paragraph in question."

To the thoughtful every incident conveys some useful moral, and the paragraph alluded to has impressed my mind with thoughts I deem most apposite to the subject on which I am anxious to address you in the present communication. A

fertile genius is unquestionably one of God's greatest gifts to man, but its versatile powers require no ordinary amount of care to control them, for the plain reason that a man of genius, feeling strong in his superiority, is frequently but too apt to make a trip when he puts forth his powers to manage matters publicly before he has mastered the *pro's* and *con's* embraced in general details. The unhappy result of his temerity is, he is laughed at by those who, for the once, are his superiors in knowledge, and, when compelled to retrace his steps, the erring genius finds that confidence in the integrity of his teachings has been grievously shaken. How many a man of genius has made shipwreck of his fame by deserting well-mastered fields to wander o'er untried ground—to venture hapazard on work perhaps not above his ability, but beyond the embrace of his previous practice and study! Among painters the name of such fallen ones is legion. Writers I briefly sum up ditto. In short, among every class of toilers, whether of hand or brain, are to be found men who have cause to regret their having entered on some ill-considered undertaking, the failures in which offer forcible proof that nature sternly demands from all a sober use of such powers as a good God has bestowed on them, also that teachings should proceed only from teachers who by much labour have been taught.

Turning towards photography, I find versatile actors there who oft cut queer capers, men who probably would be qualified to adorn some humbler sphere, setting themselves up as art-teachers. Of a truth, art pretenders are they, stringing together quotations from books ancient and modern, affecting to commence with Homer, and to follow up with Plato, to make a show of learning, and really drawing largely upon the pages of Ruskin, as is fashionable with dabblers in art, forming in the whole an *ensemble* most bombastically erudite and fantastical. I say, "Heaven forbid that I consider such sorry performances efforts of genius!" Robinson in the *News*, Davies elsewhere, have given us art lessons in good, plain, hearty English, and they are readily acknowledged the right men in the right place.

Setting art teaching aside, we discover science instructors seeking notice, some of whom would perhaps do well to select fields that need more of imagination than patient investigation and reasoning. Yet, from time to time, turn up among us men of real genius, who are wont to startle us by their originality of conception, and arouse our feelings of admiration by the acuteness of their logical powers. Let me name one: Mr. Nelson Cherrill, a gentleman I heartily admire, and truly respect, on account of his philosophic intellect. An original thinker, a man of cultivated tastes, a thoughtful and intelligent observer, possessing a skilful hand and able pen, take him all in all, he has all the requisites to mould himself into a photographic star of the first magnitude; but, alas! human vanity will peep out to make fools of the wisest; and human weakness tugs hard on the most assailable side of Mr. Cherrill when that gentleman is tempted to write or speak on printing matters. I take his last paper, read before the members of the North London Society, which contains some able, original, and well-considered remarks on the true relationship of tone with intensity; and had the paper concluded with the writer's comments on these subjects, I fain would have clapped my hands over the pages of the *News*, and cried, "Bravo, Mr. Cherrill! you have hit it cleverly." But the unfortunate supplementary remarks thrust me from the climax of enthusiasm down into the depths of sorrowful cogitation; for well I know that Mr. Cherrill has all the ability needed to make an intelligent and successful printer; but he has wisely chosen the better path, where present fame is his, and future laurels await him; where he will never, I trust, have reason, after years of toil, to say, "I have been pursuing a labour of love in a vale of emptiness; I have endeavoured to benefit my art and its followers, and now, when too late, discover that I have wronged those little ones who laugh and prattle around my ain fireside." Mr. Cherrill, I repeat, might, if it so pleased him, have made a thoroughly practical printer, but he sagely turned aside, and is not one; hence, when touching on printing matters, he presumes on his versatility, and exposes his weakness.

A word or two on the point at issue. In his comments on the supposed variations that exist in paper from the same maker, he unconsciously unfolds to the gaze of the initiated his imperfect acquaintance with the subject he attempts to discuss. He objects to making negatives to suit paper, and to pursue no end of experiments to discover the treatment papers prepared

by the same hand and from the same formula require, and dwells on the difficulty of getting paper that will print *a la Salomon*, and on advantages innumerable to be derived from a knowledge of salting formulae. If Mr. Cherrill had spent half the years of toil and experimental research over the matter that I have done, he would know that a practical printer, worthy of the name, needs no knowledge of the exact amount of salt contained in the paper he uses; the first print satisfies him on that point sufficiently for his purpose and the satisfactory progress of his operations. Besides, he could undertake to produce half a dozen kinds of prints from one ready sensitized sheet of paper and from one negative. It is not a knowledge, derived from the dealer, of salting recipes that would bribe grim Charon to row the perplexed printer on the sunny side of the photographer's Styx, that bubbles and heaves with lesser troubles. Experience, and good, hard study, form the talisman, and until that experience is gained, paper and paper albuminizers will be the scapegoats of those who fail of uniform success. Years have such spent in fruitless grumbings, and, except indirectly, their complainings have extracted no response. But the gauntlet has now been hurled by a strong arm. The accusing knight is Mr. Cherrill; his herald, yourself, sir, whom I have the honour to address. To hesitate longer would savour of pusillanimity; I therefore, on behalf of my craft, accept the glove with kind intent, and am ready and willing to do battle. Meanwhile, if your readers think it would prove advantageous to themselves if the salting formulae I adopt were made known, they are welcome to the information:—

No. 1.—Chloride of ammonium	...	...	5 grains
Chloride of barium	...	...	3 "
Albumen (fresh and pure)	...	...	1 ounce.
No. 2.—Chloride of ammonium	...	...	10 grains
Chloride of barium	...	...	6 "
Albumen (as before)	...	...	1 ounce.

Now go to work on the information, and ease you of your troubles. It is not, you will find, the amount of salt used which makes the pudding light; it is the manner in which the ingredients are mixed and stirred; and to expect good prints because you know the amount of salt the paper contains is similar to expecting tender beef and mutton because the soil on which the animals fed is familiar to you. I would undertake to produce prints scarcely differing in tone and quality from any half-dozen samples of paper prepared by any half-dozen honest dealers.

In conclusion, I hope all my brethren in the paper trade will respond to your courteous invitation, and freely pronounce their opinions concerning the true cause of the torments they are being daily subjected to. Requesting that you will kindly insert this letter in its entirety, I remain, yours respectfully,

Willesden, October 26, 1868.

W. T. BOVEY.

DISTORTION AND PERSPECTIVE.

SIR,—I am obliged to Mr. Winstanley for setting me right in that part of my letter relating to reflection from the surface of a mirror; and as the fallacy was mine, I hasten to make the "amendo honourable" to Mr. Cherrill. I trust, however, that the subject involved in the latter part of my communication—viz., the pseudo-perspective effect produced by the too near approximation of the lens to the object to be copied—may still be worked out for the benefit of the many to whom the establishment of some simple laws embracing all the conditions would be a great boon. Fond as I have ever been of photography, I have always seemed to recognize that the photographic representation in portraiture was seldom or never as the eye would see the natural object. If the plane of the sitter's head was absolutely vertical to the optic axis, the representation of the head would be passable; but let the forehead project over so little, and there would be exaggeration of that part in the picture; or, on the contrary, recline the head back, even slightly, and although all the details might be fully rendered, yet the prominence of the jaw and the narrowing of the forehead would be something more than unbecoming; they would have properties and give effects which certainly the human eye would not recognize in the figure itself when so posed. A figure may be "foreshortened" in nature without producing the idea of distortion. Why should it not be so in a photograph? Swing backs have been adapted to cameras to assimilate the plane of the picture to the general plane of the object, but they only partly overcome the difficulty; the eye detects

that there is a fault in the representation, and the ingenuity of the photographic artist is taxed to dissimulate the deformity. It must not be forgotten that a perfect rendering of the detail of the several parts of a picture is proved to be perfectly compatible with a pseudo-perspective representation of that picture as a whole, as witness the performances of panoramic lenses, where near objects seem shown as much too large as the distant ones appear too small; and I hold that we have this in a modified degree in our portrait photography. It seems to me that the points I have named are nearly, if not quite, independent of the spherical aberration of the lens; and I think the natural and practical question arises for discussion, How far should we be from the anterior plane of the objects we wish to represent, in order that the lens should not only give the proper amount of detail, but should render all the parts in harmonious proportion?—Yours, &c., JOHN ANTHONY, M.D.

Washwood Heath, near Birmingham, October 24, 1868.

SIR,—Your correspondent, and my good friend, Mr. David Winstanley, corrects John Anthony, M.D., for an alleged error in that gentleman's communication to you on the above subject. It appears to me that Mr. Anthony is right, and Mr. Winstanley mistaken. As a practical proof I would suggest the following experiment.

Place a man twelve feet behind some transparent partition, as a sheet of glass or transparent gauge, and let him hold out his hand before his body, say at three feet distance. Let him be photographed from a lens placed at twelve feet on the opposite side of the partition, so that the subject of the photographer is twenty-four feet from the lens. Then let a mirror be substituted for the sheet of glass or gauge, let the same man take up his position by the side of the lens, twelve feet from the looking-glass, and let the photographer reproduce him (with his hand stretched out as before) from his reflected image in the glass. I will venture to say that the relative sizes of the hand in proportion to the head in the two photographs will be totally different; that is, in the first, the hand will appear enlarged to the proper proportion, considering it is three feet in advance of the head and body; in the latter, the hand will appear as if it were six feet in advance.—I am, sir, yours truly,

AUGUSTUS DULCKEN.

MR. FRY'S MODE OF MASKING.

SIR,—The new method of masking described in your last, as practised by Mr. Samuel Fry, seems to be very ingenious, but I fear more ingenious than practicable. It seems to me that there are several difficulties in the way of using it to good purpose. Putting aside the fact that the loss of sharpness which must arise from the use of a mask placed outside the negative must have an injurious effect, there is, I think, a still greater difficulty arising from the nature of the mask. Let me explain, for to understand the case clearly it is necessary to follow the operation carefully to its ultimate issues.

As you have described, a transparency from a negative must be exactly the converse of the negative, and a print taken from the transparency would be a negative blackest in the highest lights, lightest in the darkest shadows. When, therefore, a print wanting in half-tone, because printed from a hard negative, is placed under a transparency from the same negative and exposed to the light, it will not be the missing half-tones which will be impressed, but the lights which will be degraded. The high lights in the mask, being the most transparent, will permit the light to pass through first, gradually producing in the print a dark spot, or a series of dark spots, in the very places which should be kept as pure lights. In the parts adjoining the pure lights, the transparency admitting a little less light, the print will acquire a little detail, but in inverse ratio to its requirements, the gradation being darker towards the lights and fainter towards the shadows, an effect which must be destructive of modelling. One allusion in your article implies a knowledge of this, but the matter required, I think, more fully elucidating.—Yours,

R. F.

DEAR SIR,—I think that photographers are greatly indebted to Mr. Fry for a valuable suggestion for improving defective prints, but I think that it should be made very clear that it is only available in case of very hard negatives, and that the dodge should be applied with great judgment, otherwise a

singularly pseudoscopic effect will be produced. I fancy that the transparency should, in truth, be only used as the basis of a mask which should be judiciously worked upon, stopping parts out; and that instead of placing it outside the printing-frame, it should be placed upon the print after it has left the frame, moving it about a little, if necessary, to prevent excess of sharpness.—Very respectfully yours,
ZETA.

October 24, 1868.

THE ENAMELS AT THE CORNWALL POLYTECHNIC EXHIBITION.

SIR,—In your report of the award given by the Royal Cornwall Polytechnic Society for enamel photographs you omitted to say that the medal was given for coloured enamels, no medal being given for plain enamels. In justice to Mr. Barnes and myself please correct this omission. I beg to inform you I did not exhibit any coloured enamels; what I exhibited were purely untouched pictures, not even spotted.—Yours respectfully,
A. L. HENDERSON.

October 28th, 1868.

STATUS OF PHOTOGRAPHERS.

DEAR SIR,—I think it would be very desirable to hold a meeting of photographers from all parts of Britain, to assemble in London during the Photographic Society's Exhibition; it would be interesting and pleasant to meet our photographic brethren. November is generally a dull month in many respects, consequently the time to photographers is not of so much value.

Several things demand our attention which it will be well to discuss: first, the Relief Fund; then we want to devise some means to avert the ruin which stares us in the face through the ridiculously low prices which prevail in many places. While incompetent hands kept the low prices to themselves it did not matter, but when able men descend to 6s. a dozen it becomes a very serious thing. I enclose an advertisement which bears out this statement. All honour to Williams, Mayall, and a few others, for keeping to a respectable price.

Another question is, Can anything be done to raise the status of photographers? I fancy it is through a sort of Cheap-Jackism that many of us are now threatened with ruin. I should like to see a photographic college founded, at which all young photographers should pass examinations at the end of their apprenticeship; then M.P.C., or some other initial, might be taken, indicative to the public of their having been properly qualified for the position they aspire to fill. A collection of photographs and things interesting to photographers might be kept in the college, so that provincial men, when they happen to be in London, might see what is done and doing.

I fear to trespass further on your space.—Yours truly,
PHOTOGRAPHER.

Talk in the Studio.

LOW PRICES, OR GOOD WORK?—A correspondent mentions a case tending to answer the question as to whether low prices, or good work and high prices, most tend to business success. He says:—"The world-famed potter, Wedgwood, when giving advice to the clay workers of Staffordshire, might, from the aptness of the remarks, have been offering counsel to the photographers of England. He cautioned the potters as a body to steer clear of the dangerous reef of low price competition, and the low price rock, but to strive, by introducing *originality and improvement*, to keep the public patronage and demand afloat. A notable instance of this is now in operation at a fashionable watering place, where prices have been for some time on the seesaw or wavering scale, where an artist—not a dauber—has appeared on the scene, and offered the world of fashion enlarged porcelain portraits at prices ranging from upwards of ten guineas each; the consequence is, that the beauty and superiority of the work cause the studio of the artist to be crowded with customers, fully demonstrating that really good work will ever maintain its way, and meet with support. The peculiarity of the medium on which these magnificent pictures are painted and worked up is a guarantee of their capability of resisting the ravages of time."

PRELIMINARY COATING OF INDIA-RUBBER.—In the course of a letter received a few days ago from M. Constant-Dellessert, of Lausanne, he remarks that he has recently used a solution of india-rubber for a preliminary coating for dry plates, in which the benzine had been so imperfectly rectified that, notwithstanding that the film was well dried at the fire, it was dissolved again when the collodion was applied, mixing with the latter and producing disastrous results. We have found that, unless the benzine be absolutely pure, chloroform is the best solvent for india-rubber for a preliminary coating. Coal-tar naphtha is an excellent solvent for india-rubber, but it should be avoided, as not sufficiently pure for preliminary coatings.

A PHOTOGRAPHER'S WIDOW.—Mr. Beattie, of Clifton, writes as follows:—"I enclose a list of those who have deemed it a duty to assist Mrs. Pearson. To-morrow I will hand over the amount to Bishop Anderson for her use. Receive my thanks for so kindly making the appeal, both in your advertising and other columns, free of all charge." The list stands as follows:—Burgess and Grimwood, Norwich, £2; Thomas Ayers, Yarmouth, 10s.; F. Davies, Dawlish, 2s. 6d.; G. E. Chertsey, 1s.; J. E. B., Cowes, 1s. 6d.; W. Mathews, Bury-st.-Edmunds, 1s.; F. B., Clifton, 2s. 6d.

PHOTOGRAPHY IN RUSSIA.—The correspondent of a daily contemporary says:—"The Czar has consented to allow photographs to be taken of all the treasures of art contained in the Imperial Gallery of the Hermitage." Photography has generally been in favour in Russia, and some of the finest photographs we have seen have been taken in Russia. We were recently favoured by General Count Nostitz with some instantaneous photographs of the Emperor's favourite riding horse, taken with a 3½ lens. Count Nostitz is an ardent amateur, and produces some exceedingly fine photographs.

MR. SOLOMON'S LAMP AT FALMOUTH.—We have pleasure in adding to the list of awards already announced in connection with the Cornwall Royal Polytechnic Exhibition, the intimation that a medal was awarded to Mr. Solomon for his magnesium lamp.

MAKING A BATH.—Mr. C. Quin gives the following minute instructions to an amateur for making a half pint nitrate bath:—"Place a piece of clean writing paper, about three inches square, in one of your scale pans, and a similar piece as a counterpoise in the other. Weigh out exactly 300 grains of nitrate of silver, taking care not to touch the salt with your fingers. A sheet of white paper should be spread on the table to catch any of the crystals that fall. The salt should be conveyed to the paper in the scale pan either with a piece of clean cardboard folded so as to form a little shovel, or else shaken out carefully. The nitrate of silver should next be thrown into a perfectly clean bottle, which is kept expressly for the purpose, and dissolved in two ounces of distilled water. When fully dissolved, weigh out a grain of iodide of potassium, dissolve it in half a drachm of distilled water, and pour it into the nitrate of silver solution. A strong deposit of yellow iodide of silver first forms, but is immediately redissolved on stirring. When once more clear, throw in a morsel of blue litmus paper and stir. If, at the end of two or three minutes, the litmus paper has not turned red, it is a proof that there is no acid present; but if, on the contrary, it changes colour, add a few drops of solution of carbonate of soda (10 grains to the ounce) and stir. The white precipitate formed will probably be redissolved. If so, add another drop or two of carbonate of soda solution until the solution remains slightly turbid after being well stirred. Next dilute the solution with eight ounces of distilled water, stirring all the time. This will produce distinct turbidity, and you must filter the solution into another bottle. Filtration is generally performed by passing the liquid through filtering paper; but as it is always best to keep nitrate of silver and organic matter apart as much as possible, a plug of cotton wool inserted in the neck of a large funnel will form the best apparatus for the purpose. A little practice will soon show you the amount of pressure to be given to the plug. The liquid should pass through in a succession of quick drops. If it does not pass clear at first, a second filtration will be necessary. Never spare any pains in filtering your bath; it is of the utmost importance that it should be perfectly clear and free from floating particles, otherwise spots and streaks will be infallibly produced."

GENERATING CHLORINE.—A Belgium chemist has devised a new process for generating chlorine. He first forms trisulphate of sesquioxide of iron, by the direct combination of this oxide

with sulphuric acid, and then mixes the trisulphate obtained with three equivalents of chloride of sodium or other convenient chloride. Upon heating the mixture in dry air the chloride of sodium yields all its chlorine.—*Chemical News.*

MANUFACTURE OF PERMANGANATE OF POTASH.—Some facts worthy of attention concerning the manufacture of permanganate of potash have been pointed out by M. Staedeler. In the preparation of this salt, by heating a dilute solution of the manganate, a third of the manganic acid is reduced to the state of peroxide without taking part in the reaction; the case is the same when hydrochloric acid is used to effect the transformation, notwithstanding that this process permits of the use of concentrated solutions. Things happen differently when chlorine is employed. The following is a convenient method of operating:—The crude pulverized manganate is abandoned in its own weight of water for several days; then a similar quantity of water is added, and a current of chlorine transmitted until the liquid becomes red; the solution is frequently agitated, diluted with four times its volume of water, filtered through coarsely powdered glass, and reduced to one-fifth of its original volume. At this point the permanganate crystallizes; it can be obtained in a state of purity by recrystallizations. The yield is 90 per cent. of the weight of peroxide of manganese employed.—*Ibid.*

To Correspondents.

BAB.—Where two solutions have to be used in succession on the plate in developing or intensifying, they should each contain the same amount of alcohol, or such amount as will make each flow evenly without causing greasy-looking marks, caused by the imperfect mixture of the two liquids of different densities. See a short article on the subject for fuller explanation.

A. B.—The enquiry you make is a very important and useful one, and the answer, fully given, would be very instructive, but would, unfortunately, require several pages of our Journal, as it would involve an explanation of the difference between good work and imperfect work in almost every detail. The Bristol pictures are good examples of good workmanship throughout: well lighted, well posed, developed properly, printed and toned with taste, and, finally, well mounted and well rolled; whilst the others are faulty in all these particulars. In the Pontypool pictures the figure is, in the first place, taken on much too large a scale, giving an effect of clumsiness to the figure. The camera requires moving further from the sitter. The figure is not well lighted, too much top-light being used. The negatives are a little under-exposed and over-intensified, causing black shadows and chalky lights without detail. They are toned a little too black; not neatly mounted, and not well rolled, if rolled at all. The backgrounds and accessories are not good. The background screen should be more even and free from marks, and should be further from the figure.

W. ANDREWS.—The number of the *News* containing the description you require has been forwarded. You cannot do better than follow out the instructions in all respects. 2. Yes; let the bath into the bottom of the box. 3. It is customary to mount stereoscopic pictures so that any two points (say the centres of each picture) shall be about $2\frac{1}{2}$ inches apart. Of course, if the centres are that distance apart, there will be also that distance between any two points in the pictures. The best and truest effect is obtained by leaving on a little more of the right-hand side of the subject in the right-hand picture, and of the left-hand side of the subject in the left-hand picture.

A. SEELEY, who seems a little inclined to indulge in badinage, sends us the following:—"Now that so much is being said about photo-engraving, I enclose two specimens of a process to be called photosketchitblackvarnishengraving, and shall be glad of your remarks thereon. It is not patented." The specimens enclosed are examples of a process introduced seven or eight years ago as photographic etching. A plate of glass is covered with an etching ground, either of black varnish or other suitable substance, and a drawing is then executed with an etching-needle, by which means an etched negative is produced, from which a print may be obtained on excited paper by the ordinary photographic printing process. The specimens enclosed, which are good examples of what may be termed the slate and pencil school of art, appear to have been executed by such a process.

GULIELMUS (Sheffield).—The markings you describe are very suggestive of over-iodizing. Collodion, when over-iodized, is very apt to yield just such markings as you indicate. If this be the cause in your case, the addition of a little plain collodion to the sample in use will effect a cure. Somewhat similar markings will sometimes proceed, however, from other causes. The use of a very old bath is sometimes a cause. The immersion of the plate

before it has well set is often a cause, especially at this period of the year. Moving the plate rapidly the moment it is put into the bath, and keeping it moving for half-a-minute or a minute after, proves a cure when the defect arises from other causes than over-iodizing. 2. It is a somewhat difficult task for us to say when a certain article appeared, of which you can only tell us that it was a good developing process, without giving us the title, as we have published so many, and are so frequently publishing such processes. You will find one in the present number of the *News*.

W. J. A. G.—By care and perseverance in the plan you describe you cannot fail of success. 2. Mr. Rejlander's address is 129, Malden Road, Haverstock Hill. You are right in your conjecture as to the "authority" it was necessary to correct, and also in your estimate of its character.

NEW SUBSCRIBER.—With the dimensions you propose the arrangement generally is good; but we should prefer at least three feet more glass at the north side, and one or two feet more in the north roof. In some respects No. 2 would be the best form, but the sun would trouble you in summer, so that on the whole No. 1 will be attended with the fewest troubles.

OLD DEVELOPER.—You can obtain a solar camera through most dealers. Mr. Atkinson, of Liverpool, will certainly supply you, and general instructions for its use will accompany the instrument. We shall have pleasure in assisting you through any specific difficulties which you may find on trying it.

HENRY LAMB.—The stereoscope described by Mr. Blanchard is of American manufacture. Whether it has yet been made by any one in this country or not, and if so at what price, we have not yet learnt. The amount of magnifying power in the instrument Mr. Blanchard exhibited was pretty good; but that is a point depending on the lenses with which the instrument is fitted; within a suitable range, any power of lens might be employed. The great advantages of the stereoscope in question were perfect illumination of the slide, convenience for use, facility in adjusting the focus to any sight, and some other mechanical advantages not usually possessed by existing and more expensive forms of box stereoscope. We think it will very probably be taken up by some manufacturer, in which case it will doubtless be noticed and advertised in these pages.

F.—Any chloride soluble in alcohol may be used. We have not noticed any special difference in the results of different chlorides. We prefer citric acid to any organic substance for the purpose which we have tried. We saw the letter to which you refer. The name was, as you conjecture, an interpolation, to cause a false suggestion. We had a letter from the writer of the letter a few days after it appeared.

R. N. F.—You will see some further explanations of the method of masking in question on another page.

B. F.—Very dilute sulphuric acid (say one part acid and four parts water) may be employed to clean lenses. Take care to rinse well afterwards, and dry thoroughly. 2. No. 3 of your list is preferable.

M. D.—The simplest mode of ascertaining the equivalent focus of a portrait combination is that which we suggested some years ago. Focus an engraving sharply on the ground glass, getting the image precisely the same size as the original. Then remove the lens, and measure the distance exactly between the ground glass and the engraving. One-fourth of that distance is the equivalent focus of your lens. Thanks for your good wishes.

SILEX.—The proportions of the room certainly present some difficulty, but such as may, we think, be overcome. The greatest is the great height of the wall—twelve feet—in which you can have no side-light. There is a method, however, of dealing with this. If you raise the floor of the room three or four feet, and so bring the sitter nearer the skylight, you will be able to submit him to a much larger volume of light, and avoid slowness. If the premises answer well in all other respects, we should be tempted to try this method. We should put in a good length of skylight, broken up with as few sash-bars as possible on the north side, and a smaller skylight, for use in dull weather, on the south side. Thanks for the paragraph, which we shall use.

E. SAWYER.—We have written to our correspondent, and will let you know the result next week.

STEREO.—Received. Thanks.
Several Correspondents in our next.

Photographs Registered.

- MR. J. STUART, Glasgow,**
Photograph of Prince of Wales laying Foundation Stone of Glasgow University.
- Photograph of Foundation Stone of ditto.**
- MR. P. A. F. VILLIERS, Newport, Mon.,**
Photograph of Sir J. Ramsden.
- Photograph of Mr. Rees Jones.**
- MR. J. MILTON, Newcastle, Stafford,**
Photograph of Map of Borough of Newcastle, Stafford.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
A Photographer's Relief Fund	529
The Effect of Manipulation on the Character of Negatives	529
Echoes of the Month. By an Old Photographer.....	530
Backgrounds and Accessories. By J. Martin	531
Instructions for Fosing.....	532
Collodio-Bromide Dry Plates. By M. Carey Lea.....	533
On Intensifying Weak Negatives. By M. H. A. Eckert, of Prague	534

	PAGE
Pictorial Effect in Photography. By H. P. Robinson.....	534
Correspondence—A Bundle of Old Letters—A Photographer's Relief Fund—Mr. Fry's Method of Masking—To Strengthen Varnished Negatives—Proportion of Salt in Albuminized Paper—Portraiture "on Approbation"—The Photographs of the Late Eclipse taken in India	536
Talk in the Studio	539
To Correspondents.....	539

A PHOTOGRAPHER'S RELIEF FUND.

SHALL IT BE ESTABLISHED IN SIX MONTHS?

ONE of the chief obstacles to the establishment of a Photographer's Relief Fund, as to many other good projects, is the difficulty of securing a beginning. All are agreed that to commence such a project and fail to carry it to a successful issue would be mortifying in the last degree to all concerned, and would injure rather than promote the cause of charity; and as success in such a purpose cannot be quite certain, it is probable that this uncertainty may in some degree account for the inaction in the matter of practical men. We propose, therefore, to those interested in the matter, a test operation, by which some idea may be obtained of the success which will follow the completion of a satisfactory organization for the administration of a Benevolent Fund. Of the more complex machinery involved in a Provident Fund we say nothing at present.

A generous photographic amateur offered, in our columns a fortnight ago, to give fifty pounds to a fund, if within six months a satisfactory committee were formed for its administration. We simply propose to work out that idea to its legitimate issue. Let those of our readers who believe that such an organization is desirable, and that it should be formed as early as possible, follow the example of the amateur just referred to, just in such proportion as they feel disposed to contribute. They will simply have to write, undertaking to contribute as many shillings or as many pounds, either as donations or annual subscriptions, as they think right to give, on condition that a satisfactory committee be formed for its administration within six months. We shall neither receive subscriptions nor publish names at present, but shall preserve a record of the offers, and in due time publish the result—that is, the amount of money conditionally promised. If the promise of success justify further action, we think that it will not be difficult to induce a committee of capable and trustworthy men to undertake the necessary steps for forming a permanent organization for administering the fund. This done, a treasurer would be appointed, to whom the contributions might be forwarded direct, and who would duly publish his acknowledgments. If, on the other hand, the response to an invitation like this be insufficient to justify any permanent organization, that part of the question will be set at rest for the present.

This plan will, we think, afford a practical means of testing the question as to how far a general conviction prevails as to the need of such an organization, and how far a widespread willingness to contribute to such a fund exists. Besides tending to settle these questions and some others raised by a correspondent whose letter appears on another page, it affords an opportunity for those interested in the question to commit themselves at once to some tangible step. We shall hope to hear from many of our readers.

THE EFFECT OF MANIPULATION ON THE CHARACTER OF NEGATIVES.

MOST experienced photographers have observed in the course of their practice that the mode of manipulation has some effect on the character of the finished work: not merely in what may be termed the mechanical character of the result, but also on points that might be supposed to be due to chemical action. Of course it is natural enough to expect that careless manipulation should produce such defects as uneven films, stains, and other irregularities; but it would scarcely, at first glance, appear a matter of course that hardness or softness, excess of detail or intensity, should be largely due to purely manipulatory causes. There are, however, various modes in which manipulation may influence the character of the result, some of which are familiar to practical photographers; but we are about to point to one which is, we believe, unfamiliar—at any rate it has not before been pointed out.

The fact to which we are about to refer was pointed out to us by one of our most successful professional photographers, who, having observed the circumstance accidentally, proceeded, in the course of considerable experience during the summer with large plates, to test the matter carefully, so as to leave no doubt as to the certainty of the results. His position is this: that in using precisely the same materials, in the same proportions, with the same exposure, a negative in which harmony and softness shall prevail, or one in which contrast and intensity shall prevail, may be produced at will by the mode of manipulating during development. Some operators will be disposed here to exclaim, "Of course it will depend upon whether the free silver solution be driven off the plate, or retained when the developer is poured on." It is true that this would affect the result, a less vigorous negative being produced when the silver solution is driven off by the mode of applying the developer; but this is not what is meant. The difference to which we refer, between the prevalence of contrast or detail, will depend upon the mode of holding the plate, and whether it is held still or kept in motion. Assuming that the chemicals, &c., are in good condition, and the exposure right, if the plate be held still after the developer is applied, a soft harmonious negative full of detail will be the result; whilst, all the conditions remaining the same, if the plate be kept in constant motion after the developer is applied, a negative in which contrast and intensity rather than detail prevail will be invariably obtained. These are the facts brought under our attention as the result of careful observation, no theory being offered in explanation of them.

The facts, it must be admitted, at first glance, seem singular enough, nothing in the means being apparently adequate to produce the end; but we think we can offer an explanation of the probable causes in operation which will account satisfactorily for the result. When an ordinary developer is applied to the exposed film, it will be observed that the high lights appear first, the half lights following, and so in regular succession, the least illuminated details being developed last. It will also be observed that in the process of development there is a natural tendency to aggregation in the deposit of silver: wherever light has most acted, there silver will be most readily precipitated, and hence, in an under-exposed picture, the lights acquire great density before imperfectly illuminated details are brought out at all. It must be borne in mind that whilst the haloid salts of silver in the film—the iodide and bromide—form the initial image, appreciable thickness and printing power are obtained from the free nitrate on the film. If these facts are borne in mind, then, it will be seen that after the developer is applied a double action is in progress, the image formed by light on the bromo-iodide of silver is in course of development, and the free nitrate of silver present is in course of precipitation on that image, giving it a certain degree of appreciable density, the rapidity of the precipitation of silver being in the ratio in which light has acted. If, then, the plate be kept still, the free nitrate of silver, being equally spread over the surface of the plate, is gradually precipitated, and the lesser lights, commonly called the detail, slowly but surely acquire sufficient density from the precipitation of the nitrate of silver immediately in contact to give them printing value; and the higher lights, only securing the precipitation upon them of as much free nitrate as is in contact with them, do not acquire excess of density. The result is a negative in which detail rather than intensity prevails. But if, on the other hand, the plate be kept moving, the tendency to aggregation is brought into active operation. The free nitrate solution being kept in motion over various parts of the plate, the lights, which are brought out first, having secured the precipitation upon themselves of the silver solution in immediate contact with them, find themselves in constant contact with a fresh supply, which in turn is precipitated upon the parts which in virtue of the greater action of light have the greater attraction for it. The lights thus go on rapidly aggregating the deposit of silver. In the meantime the minor lights, consisting of the detail in the shadows, suffer in two ways: first, they are robbed of the silver which should have helped to build them up; and in the next place, the high lights quickly acquiring sufficient density, the development is stopped, of necessity, before the less illuminated portions have had time for full development.

We think that on this view of the case it will be seen that it is perfectly natural that keeping the plate in motion should tend to give intensity to the lights, and keeping it still should tend to give full value to the less illuminated details. We have before pointed out that the use of a weak developer tends to the production of contrast, and the use of a strong developer to harmony, the tendency in both cases being due to causes similar to those we have just explained: a weak developer, acting slowly, permits of the aggregation of deposit by the lights, whilst a strong developer, acting quickly, brings out the detail rapidly, and, at the same time, precipitates the full proportion of silver thereon.

Our own observation has confirmed the view of the effect of manipulation which we have here set forth; and we doubt not that it will be borne out by the observation of intelligent photographers, especially where large plates are used, which of course afford the best illustration of the facts involved. A knowledge of facts of this kind will not only frequently be found useful, but will go far to explain the production of discrepant results with the same materials by different operators.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

PRESENTATION PRINTS—MR. FRY'S MODE OF MASKING—PHOTOGRAPHIC EXHIBITION—PHOTOGRAPHERS' RELIEF FUND—FALSE REPORTS—SOCIETIES.

It has often struck me that the distribution of presentation prints is one of the most useful, as well as one of the most pleasant, of the duties of photographic societies. If the office of the committee of selection be exercised with judgment, the prints so distributed may possess a highly educational character. Examples of novelty in process, of skill in mechanical or chemical treatment, or excellence in art, thus distributed by societies, often teach more forcibly and practically than many papers or the discussions thereon. The North and South London Societies have both admirably carried out this function of a society. They have both been amongst the first to present examples of carbon printing to their members. They have both aimed at giving examples of the work of the great masters in photography, men who excel alike in the technical and the artistic qualities of their work. I find the names of Bedford, Mudd, Rejlander, Robinson, Lake Price, Blanchard, Bingham, Wilson, Vernon Heath, Frank Good, Cherrill, and Woodbury amongst those whose works have been distributed amongst the members of these two societies.

The last distribution of the North London Society is surely the most extraordinarily liberal one which was ever made under similar circumstances. Let it be remembered at the outset that the subscription to this Society is but half a guinea a year, and that after the payment of necessary expenses the balance only can be devoted to the purchase of presentation prints. The prints distributed this year must, however, estimated commercially, have been worth three or four times the amount of the annual subscription. First, there was a magnificent 12 by 10 subject-picture by Lake Price, entitled "The Falconer," never before published; next, a 16 by 12 landscape by Mr. Cherrill, with the most glorious clouds ever produced, I think, in so large a photograph; and next, two whole-plate studies by Rejlander, printed by Woodbury's process. All these were mounted on good cardboard—not plate paper—with India tinted mounts. The South London present their members with one of Rejlander's charming studies, and a splendid carbon print, 16 by 12, from one of Robinson's subject-pictures. The members of the London Photographic Society have their prints yet to receive; but prints from Mayall, England, and Robinson are promised.

The suggestion of Mr. Fry for a novel mode of masking is very ingenious, and may doubtless, in many cases, prove eminently useful. A photographer will, of course, always try to produce harmonious negatives, through which the printing of all parts will go on in due order, without masking or retarding in any part; but, despite the greatest skill, over-dense negatives will sometimes be obtained, and special subjects will at times present special peculiarities which render masking imperative, and the transparent positive undoubtedly presents the best bases for a mask which can possibly be obtained. I say bases for a mask, because I apprehend that, in the majority of instances, the photographer of taste will see something in the light and shade of his picture which may be modified and improved by working on the mask.

I have been gratified to find generally prevailing amongst photographers whom I meet a pleasant anticipation of the forthcoming exhibition of the Photographic Society, and of the social reunion with which it is to open. It seems to be a general opinion that the easy absence of formality which prevailed at the last exhibition meeting rendered it much more agreeable than a conversazione at which evening dress is *de rigueur*. I look forward with interest to the display of pictures, especially in the department of portraiture, in which I expect to see a considerable revolution

since last year, the change being in many respects for the better. There will doubtless be a considerable prevalence of what a facetious friend terms "Salomoniac" pictures. I have seen many capital examples, and heard of many more. The first impulse of many English photographers was to wonder at the photographs of the artistic Frenchman; next to derry them; and since then has come the better phase, and the tendency is to profit by them, and we shall see the results, doubtless, at this exhibition. Some have been deterred from attempting anything of this kind from a feeling of dislike to the notion of imitating. I do not think that adopting a new style and aiming at a new phase of excellence should be regarded as imitation. If it were so, every one who has taken card portraits is an imitator. But it is quite possible to adopt a style without imitating individual examples of that style; and such adoption is not only permissible, but is often praiseworthy. Taking a high place amongst the specimens of this new style will be found the contributions of Mr. V. Blanchard, many of which are most admirable. M. Fradelle will, I believe, exhibit similar pictures, in the production of which I am told he is doing a very large business. Mr. Fry will, I believe, exhibit some fine examples of the same kind. Mr. Leake has done exceedingly good work in this direction, and I hope he will send some specimens to Conduit Street. I have seen some examples by Messrs. Robinson and Cherrill, which have been mistaken for Salomon's pictures; and I am told that they have a fine series which I have not seen, some of which will doubtless be sent to this exhibition. Mr. N. Briggs, of Leamington, will doubtless send his prize picture and others of the same kind. He contributed to the Falmouth exhibition something styled in the catalogue "Emolliotypes," specimens of which we may hope to see, and learn something of their character. Robinson's "Returning Home" will doubtless be there; and examples of Mr. England's last summer's work, produced by the wet process, by the way, to which, for this season, at least, I understand, he returned. I believe we shall have some examples of the charming works—both in portraiture and shipping—of Mr. Hughes; and of the summer's work of Bedford, and of Gordon, and scores of others, so that the exhibition can scarcely fail to be an attractive one.

The offer recently made in your pages of a donation of fifty pounds towards a benevolent fund will surely stimulate effort to initiate a society of some kind; but it appears to me that the proposition for forming such a fund has not excited the universal interest which might have been expected. Letters have appeared from time to time in your pages referring to it as a desirable thing, but it has not been discussed in detail. It has not been brought forward at photographic societies, nor talked of much in the circles in which photographers most do congregate. Is it because photographers, as a rule, are not poor, and do not see the prospect of poverty, or because the number of those amongst them most likely to feel the pinch of necessity do not make their voices heard?

Apropos of some false reports which the editor deemed it right to contradict, I was struck with some remarks of a cynical philosopher in a recent number of *Belgravia*, on the subject of false reports. I suppose it is at times necessary to correct special misstatements, but I cannot help agreeing considerably, on such subjects, with the philosopher, whose words I will, with your permission, quote:—"If," says he, "you wish to get on comfortably in this world, it is best to allow your brother, and your sister too—by whom I mean everybody—to lie themselves black in the face; so long as they refrain from forging your name, and so getting you into pecuniary trouble, they can't do you much harm. Leave it to Mr. Carlyle's Eternals in their own good time to proclaim the truth. As a rule, it is impossible for any man thoroughly to disprove nine hundred and ninety-nine out of a thousand falsehoods;" and hence, he argues, it is not worth the trouble to try. Dan O'Connell used to say,

"Give a lie ten days' start, and the truth will never overtake it." I object, however, to this pessimist doctrine; I fancy that lies, as well as curses, are like chickens, and come home to roost, and that "ever the truth comes uppermost, and ever is justice done." So mote it be.

The societies generally have recommenced their meetings. The North London had a capital paper from Mr. Cherrill, of a character a little too abstract, perhaps, for discussion generally, although a somewhat animated discussion arose incidentally out of it, regarding the quality of albuminized paper, and the proportion of salt employed. Some of the members thought if they knew the proportion of chloride used with the albumen in preparing paper they could more readily determine the proper strength of silver solution necessary to begin with, and the proportion of silver necessary to maintain that strength. Albuminizers seem to think that such information is not necessary: that the skilled printer will quickly learn by experience the kind of treatment necessary for any sample of paper, and that the unskilled printer is scarcely worth considering. The argument is bad, I think, in both cases; and the time will come when the proportion of salt used will be marked on the paper as a matter of course.

At the South London a somewhat unusual subject for a photographic society was discussed. Mr. Blanchard exhibited and described an American stereoscope. It possessed three especial points of superiority over most of the instruments familiar at this side of the Atlantic: it was perfectly open; permitted the slide to be well illuminated by artificial light, which few ordinary instruments permit with any convenience; it permitted ready and extensive adjustment to the focus of various eyes; and it was simple and cheap. Mr. Blanchard thought that the introduction of such a stereoscope to the public would give a new stimulus to the demand for stereoscopic pictures. I hope that the instrument will be shortly introduced into commerce. The Liverpool and Edinburgh Societies have had good meetings, but no point of especial novelty was introduced.

BACKGROUNDS AND ACCESSORIES.

BY J. MARTIN.

MUCH has been said and written upon the management and painting of scenic backgrounds and accessories for the studio, and many complaints have been made (with good cause) of their unnatural and disjointed effect. I think the great requisite—truth of perspective—has been overlooked and neglected; often, I fear, from a want of knowledge, both in the photographer and the painter. It need cost no more trouble or expense to make them correctly designed than otherwise.

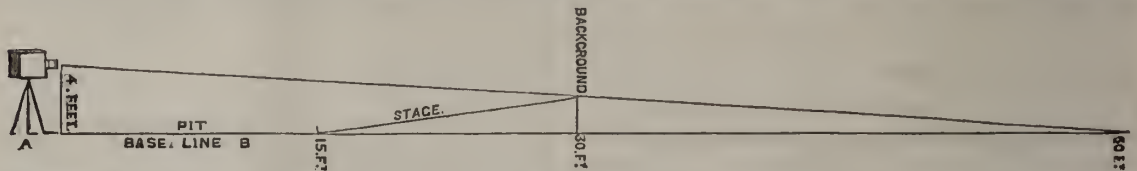
I consider the greatest requirement with pictorial backgrounds and accessories is that they should be painted *en suite*, meaning from the same point of distance. This will be determined by the distance the camera is to be placed from them; this, again, must be governed in most cases by the length of the studio in which they are to be used. Thus executed they will, when arranged in their proper situations, appear together in true perspective from one certain spot which is the true point of view. At this place the camera should stand, and, whatever the size of the photograph to be produced, should always remain there, and never be shifted either nearer to or further from the background, or from side to side, as is often done. Following this method it is necessary to use cameras and lenses of various sizes, but not so various as might be expected, as pictorial backgrounds and accessories are seldom needed except for full or three part length figures or groups. Heads or busts, for vignetting, are best executed on plain backgrounds of a light colour. Half or three part length portraits look well with a graduated plain background, so arranged as to bring the shaded side against the light side of the head. If any accessory is used, let it be, in such pictures, some simply

designed *solid object*, placed in half shade; in these cases the camera may be moved *ad libitum*, as in plain backgrounds; there are no perspective lines to distort, and solid accessories vary their perspective with truth according as the point of sight is altered.

To prove that this proposition is founded on correct theory, let the reader, by way of experiment, study the appearance of solid and painted objects from various points upon the ground glass of the camera, and he will find that solids will retain their truth of perspective when seen from any angle of view, whereas painted ones will, from any other than their proper point of distance, appear distorted. How ridiculous, then, must be the effect of a number of such articles, each having its own point of sight, jumbled together in one picture! The most perfect scenic representations are to be found at the theatres; from them we should borrow our theory, and, as far as possible, follow their practice in these matters. Stage painters always arrange their perspective from what is sometimes called the painter's point: this is the front box, in the lower tier, behind the pit; from this

spot the scenery and side slips all unite in pictorial effect so naturally as to appear marvellous. Now step into one of the side boxes near the stage, and the enchantment will vanish, the scenery will appear badly arranged, and the perspective false, for you are no longer looking at it from the proper point of view; before, however, leaving this box, notice the stage floor, and you will find that it slopes upwards towards the horizontal line of the scene, and is so arranged as to make the stage appear much longer than it really is. Thinking that this principle might, perhaps, prove of service where scenic effects are required, I send you a diagram and explanation of the method of finding the correct inclination of any floor, for any proposed increase of apparent length. The diagram will explain the principle whereby the appearance of increased depth is given to the stage by theatrical painters, and which, I think, might be used to some advantage by photographers.

Suppose, for example, a studio which will allow 30 feet in length from the camera lens to the background; place the camera at A, the lens being 4 feet from the floor



or base-line B, which must be drawn to scale of such a length as the stage is required to appear, which we will suppose, in this case, to be 60 feet. The height of the lens from the ground will give the height of the horizontal line in the scene. Now mark off from the lens upon the base-line 15 feet, and make a mark; this will give the space requisite for general convenience, which in a theatre would represent the pit or space between the front box and the stage. Make also a perpendicular line at 30 feet; this gives the real length of the studio between the lens and the background; draw a line down from the lens to the end of the base-line at 60 feet, and where it crosses the perpendicular line made to represent the real distance of the background from the camera is the height to which the floor or stage is to be raised, and it will correspond with the horizontal line at the height given for the camera lens. The real length of the stage is not arbitrary, but may be varied in proportion to that of the pit; but the rise in the floor should not commence nearer to the lens than the width of the scene to be represented. In short studios the apparent increase of length will be circumscribed, as the greater the apparent length in proportion to the real length, the greater the rise of the floor must be, and therefore the more acute the angle of the floor from the base-line. A low horizontal line will be found preferable in scenic effects as accessories to portraiture for many reasons: it gives, for instance, a nobility of appearance to the figure; the head and shoulders are thus placed against the sky, and are not cut by the horizontal lines in the scene; the camera is not tilted, and the faint colour of the sky and distance gives relief to the head without needing its shadows to be heavy; it avoids, also, the chance of the comical effect which might be produced by the conical summit of some neighbouring hill appearing as a cap of liberty on a gentleman's head, or, in case of a profile, a too strongly-marked representation of a river issuing from his mouth. Care should, in all cases, be taken by the painter that the scene is not too pronounced. Painters provide a platform or high chair on which they seat their patrons, and by this means the horizontal lines are made to conform with the picture to be painted. The horizontal line is an attribute of vision, and its laws are unalterable; photographers should understand that as they do not use their heads as cameras, or their eyes as lenses, but instruments made by the opticians, they therefore delegate the power of seeing and representing the intended picture to

these instruments; hence, under whatever circumstances and in whatever position they place them as regards the scene before them, so accordingly will they represent the picture they produce, and not as they themselves may view it. Such being the case, they can only hope to obtain scenic representations in correct perspective by placing the camera always at the painter's point, at the same time taking care to have their scenes and slips executed correctly to suit it.

I cannot well leave this subject without saying a few words upon light and shade; these are, in fact, parts of the study of perspective, and the correct application of their laws is essential to truth in scenic effects. Studios, if happily situated, do not admit the entrance of direct sunlight, or, by the arrangement of blinds and shutters, it is prevented. These arrangements ought to be capable of producing a variety of effects, and of throwing the light at such angles upon the sitter as the artist may think fit; as the lights and shadows of scenic backgrounds are not produced by projecting angles, but painted in by light and dark colours upon a flat surface, they will not alter according to the angle of the light in the studio. Therefore, before having his backgrounds painted, the photographer should experiment in his studio until he finds the most agreeable angle of light under which he can generally operate, and then direct his scene-painter to throw the lights and shadows on his backgrounds. Accordingly, thus having the perspective and light and shade of his scenes and of his figures agreeing according to rule, he may hope to achieve a great success in truth of pictorial effect, provided the camera is placed at the proper point.

INSTRUCTIONS FOR POSING.

In a letter to the *Pulletin Belge de la Photographie*, M. Omer Bordeau communicates the method adopted by one of his professional photographic friends for the purpose of rendering sitters tractable when under the influence of the camera. The plan followed by this gentleman is to hang up in the studio a large placard of instructions, which may be read and thought over by those who frequent his establishment; and the short and concise nature of these rules, as also the ludicrous final warning held up as a punishment to evil doers, no doubt very materially contribute towards the creation of the cheerful and natural faces of the portraits to be seen among his collection. For this reason we do not

hesitate to give our readers a copy of the instructions in question, for the end justifies the means, and in photography, especially, all methods are good which lead to good results.

1. Choose your own natural position, without inconvenience, affectation, or constraint.

2. Do not condemn yourself to painful immobility before the photographer desires you to remain quiet.

3. When the time of exposure commences, which will not last very long, preserve an absolutely immovable position, looking steadily at any object that the photographer has pointed out. Assume an easy attitude, and put on a pleasing expression, so that the lens may not reproduce a fatigued, stern, and solemn countenance which will certainly not be your own.

4. Do not omit to close your eyes if you should feel it necessary so to do; but be careful to assume the same look and expression as before immediately afterwards.

5. Ladies will do well to avoid perfectly white dresses or bodies, which appear in the photograph as a hideous white patch without detail.

6. The success of the portrait depends upon an intelligent execution of these instructions.

7. In case of infraction of any of these rules the criminal law of photography condemns you to receive a portrait without a head. BEWARE!

COLLODIO-BROMIDE DRY PLATES.

BY M. CAREY LEA.*

I PUBLISHED last spring an extremely simple and easy process for preparing dry plates. During the interval I have had inquiries from several who had tried the method, and who had found the plates comparatively insensitive. Never having had much trouble myself with them, I was surprised at this complaint, but was able, however, to say that probably the sensitive mixture had not been left to stand long enough before using. On returning to the city recently, after an extended absence, I proceeded to prepare some of these plates, and having previously had regular and unvarying success, I took them out with me without the precaution of trying the plates. I found them to require long exposures, and to give a weak and poor image.

Now, having traced out without difficulty the source of the trouble, I find it to be exactly such as must meet almost every one who tries the process, at the very start, and this may deter many from prosecuting a process that might, after all, suit them perfectly. I shall, therefore, show the way of obviating this insensitiveness with ease and certainty.

Those who practise any collodio-bromide method always sensitize with nitrate of silver about twice as much collodion as they want; the residue only requires the addition of a little plain collodion to keep for many weeks. The corresponding quantity of nitrate of silver to the plain collodion so added can be put in twelve hours before wanted.

The secret lies in this residue, which, if in good sensitive order, has the property of bringing up the fresh collodion added to a proper condition. It is where one starts afresh after a long interval, and has no such residue to begin with, that the trouble of insensitiveness shows itself. And this is exactly the position of every one who tries the process for the first time.

In order, therefore, to get a fair start, the following will be found useful:—

Take 8 ounces of the plain bromized collodion as below, and sensitize it with $21\frac{1}{2}$ grains of nitrate of silver to the ounce, viz., 172 grains. Let it stand, with occasional shaking, for ten or twelve hours. Next add some of the same plain collodion (say 4 ounces), and let it stand, with occasional shaking, for two or three days; then, about ten or twelve hours before coating the plates, add the nitrate of

silver corresponding to the last addition of plain collodion (if, as above, it were 4 ounces, add 86 grains); shake several times at intervals of an hour or two; let it stand six or eight hours, and either decant or filter.

After use, add about the quantity of plain collodion that will replace what has been consumed. Have thick, brown paper pasted over the bottle, and on this mark the quantity added. Shake, and set aside. Ten or twelve hours before the next occasion for using, add nitrate of silver according to the quantity of plain collodion last put in and noted.

A curious change takes place in the collodion after sensitizing. After some times it gives a bluish film, transparent enough to allow exterior objects to be plainly distinguished through it. Then it changes and gives a film so opaque that I have often been unable to distinguish the bars of the yellow window through it. This is the sensitive condition. It is acquired without difficulty when there has been a residue of a previous lot, but this opaque condition requires several days, sometimes, to appear with entirely fresh material, even when the collodion is six months old.

All the above is applicable to all the varieties of the collodio-bromide process, not especially to mine. My form of the process is the simplest of all modes of preparing dry plates, as there is but one bath of any kind needed, and no washing. As I have modified my formula, I give that here which I now use:—

COLLODION.				
Alcohol	...	...	...	15 ounces
Ether	...	...	...	20 "
Bromide of cadmium	...	...	...	375 grains
Bromide of ammonia	...	...	...	60 "
Pyroxyliue	...	...	...	210 "

Let it stand two weeks.

The cotton must be very intense. I prefer "Helion No. 1," to be sensitized with very finely pulverized nitrate of silver, $21\frac{1}{2}$ grains to the ounce. Fused nitrate answers best.

The bath is prepared as follows:—

Lead Solution.—Dissolve a quarter of an ounce of acetate of lead in 2 pounds of acetic acid No. 8. Filter.

Gallic Solution.—Dissolve 1 ounce of gallic acid in $4\frac{1}{2}$ ounces of alcohol. (Pour $4\frac{1}{2}$ ounces of alcohol into an ounce bottle of gallic acid, and let stand twenty-four hours). Filter. For 4-4 plates, or smaller, take—

Water	...	...	...	6 ounces
Lead solution	...	...	...	1 ounce
Gallic solution	...	...	...	$\frac{1}{4}$ "

Mix well; filtering is unnecessary. I have already explained the usefulness of adding litmus to this, to colour the plates, and prevent blurring. To such as have not the former paper at hand I may say, briefly: Cover one quarter pound of litmus with boiling water, and set away in a warm place, covered, for a day or two. Throw on a filter, and pour on hot water till about 20 ounces have run through. Add 4 or 5 ounces alcohol to make it keep. Into the above bath pour as much of this as will render it, in consequence of the acetic acid contained, blood-red, 2 or 3 drachms, depending upon the quality of the litmus. The plates should be rendered light-pink.

Into this bath of lead, gallic acid, and litmus, plates coated with the sensitized collodion are plunged as soon as they have set, precisely as if they were being placed in a negative bath. May remain in till all redness disappears, and then, without any washing, before or after, are simply dried. Nothing can be briefer or simpler.

I have generally found it necessary—or, at least, useful—to edge all dry plates with india-rubber dissolved in benzine, 5 or 6 grains to the ounce. A camel's hair brush is held to a glass rod, which extends one half inch below the point of the brush. This is run round the corner of the plate so as to leave a rim about 3-16 inch wide. In five minutes the plates may be coated. The brushing off with a wide brush,

* From advance sheets of the *Philadelphia Photographer* for November.

to get rid of dust, should be done immediately before collodionizing, not before edging.

Since I first published the process I have had an excellent opportunity of testing the keeping qualities of the plates.

Some plates prepared and intended to have been used at once were left for near six months in the slides, and, in spite of the almost unexampled heat of July last, were found in September to be in good condition, and to have lost none of their sensitiveness. In fact, they could not be distinguished by their behaviour from plates prepared a few days before. The importance of this quality does not need to be dwelt upon.

PICTORIAL EFFECT IN PHOTOGRAPHY;

BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.

BY H. P. ROBINSON.

CHAPTER XL.

IN some of the later chapters I have introduced complicated groups of figures with landscape backgrounds, which, to those who are unacquainted with the scope of our art, may appear impossible in photography. Indeed, some of those who do not hesitate to show in print how limited is their knowledge, have pointed out that a group on different planes could not be secured by the aid of lenses and chemicals, and that it was impossible to pay proper attention to the individual constituents of a large group of figures. I may answer, that my object in introducing these groups from paintings has not been to offer to photographers examples for exact imitation, but that it may be shown how immutable laws exist in all good works of art, whether that art is exemplified in the lowest subjects or the highest; that the laws of balance, contrast, unity, repetition, repose, and harmony, are to be found in all good work, and that the arrangement of the general form of nearly all pictures is based on the diagonal line and the pyramid. I have thought it of more consequence to fix these facts on the mind of the student than to set before him examples for imitation, however good, which he would have blindly to follow without understanding and without profit.

But the scope of photography is wider than those who have only taken a portrait or a landscape suppose. There has not been a single group introduced into these lessons that could not have been reproduced from life by the means our art places at our disposal. I do not mean to assert that a subject containing so many difficulties as Goodall's "Swing," for instance, has ever been done in photography, but it is not so much the fault of the art as of the artists, that such a picture has not been successfully attempted. It has not been the failing of the materials, unplastic as they are when compared with paint and pencils; it has been the absence of the requisite amount of skill in the photographer in the use of them, that will account for the dearth of great works in photography.

To show that large groups are not only possible, but comparatively easy of execution when they are considered seriously and with a determination to succeed, I introduce, for illustration this week, one of my own pictures, taken some years ago, when photographers had much less facilities for producing good work than they have at the present time. The engraving is a reduction, by Mr. Fruwirth, of one which appeared originally in the *Illustrated London News*, but of a larger size,* and is the only one I have given

of my own works, one of which I should not have given as an example at all had I been able conveniently to obtain a picture by any other photographer that illustrated my proposition so clearly. But photographers shun this kind of work more, I believe, because they think it less profitable than portraits, than from inability in some of them to do much better work than I here take for illustration. I also take this picture because the engraver has more nearly given the effect of the photograph than some others of mine that have been engraved. The original photograph is 22 by 17 inches in size, and was taken in seven negatives, and afterwards printed together by combination printing.

This plan, besides other advantages—such as the obtaining objects on different planes, and getting larger pictures than by any other method, with the exception of enlargement—enables the operator to devote all his attention to a single figure or sub-group at a time, so that if any part is imperfect from any cause, it can be substituted by another without the loss of the whole picture, as would be the case if taken at one operation.

I shall leave the now advanced student to determine for himself the principles on which the composition is based, and to do, I hope, better things in the same direction.

ON INTENSIFYING WEAK NEGATIVES.

BY M. H. A. ECKERT, OF PRAGUE.*

I DEVELOP my plate with the ordinary iron solution, and after it has been thoroughly washed, I proceed at once with the fixing. After this, the plate is again well washed, and placed in a porcelain dish containing sufficient clean rain or river water to cover the negative; the water should, if possible, be filtered. Every negative taken during my day's work, which lasts five hours, is treated in this manner, and

facts already existing; and, however we may doubt their ever attaining to the perfection they aspire to, so as to supersede the pencil or the graver, we must admit that some of the things they have lately done are of great merit, and strikingly effective in the result. Mr. H. P. Robinson is one of the most successful labourers in this field. His painfully real little group-picture entitled "Fading Away," representing a young girl leaning back in an arm-chair, apparently in the last stages of decline, for a short season attracted groups of admirers round the windows of the photograph dealers. This year he produces a pleasanter and also a more extensive and elaborate subject, which is deservedly hung in the place of honour in the exhibition of the Photographic Society, and which he entitles "A Holiday in the Wood." We give an engraving of this picture, the subject of which is a party of rustic children amusing themselves in a thickly shaded spot on the outskirts of a wood, on a bright day in summer. In the centre, seated on a bank, are three young girls, one of whom is weaving garlands of wild flowers, whilst a younger companion peers over her shoulder, watching the process with engrossing interest; the third, a healthy specimen of rude country life, is carelessly lying on the ground, and laughing heartily at the harsh airs of a pretty little child in the foreground, around whose head another of the party is intently engaged twining a wreath of woodbine. Further back, and on the very top of the mound, is a girl with her back towards us, vigorously hailing some of her companions who are newly arriving at the wood. In the mid-distance, two other little girls are seen advancing through a woodland path, basket in hand, to join the holiday party. The whole scene is closed by a picturesque background of oak and other trees, which give a character to the situation in complete harmony with the sentiment of the little incident commemorated.

"We must award high praise to Mr. Robinson for the judgment and eye for effect with which he has arranged his figures, and for the graceful combination and plan of outline which is the result. The little sisters themselves, also, are to be commended for the attention which they have obviously paid to his instructions, and the efforts they make to appear as much at ease as possible. Complete self-obliviousness and spontaneity of action were, of course, not to be looked for; but as much has been done towards their realization in the present production as could be expected.

"This interesting specimen of the photographic art measures twenty-two inches by seventeen."

The *Daily News* of January 14, 1861, had also a long and appreciative notice of this picture, from which we make a few brief extracts. After some remarks on the great "artistic knowledge" displayed, and the power which the artistic qualities had to make the picture "dwell on the memory," it describes it as follows:—"A number of children are playing in the recess of a wood, which is one inextricable tangle of wildly picturesque and luxuriant vegetation. The three central figures seem hatched in sunshine, their flaxen hair flowing like a golden halo. Placed upon a turfy pedestal, they are arranged in attitudes of perfectly natural rustic grace, yet, without, the group they form has a chaste elegance almost Greek and monumental. The other children are posed with almost equal felicity, and the harmonious grouping of such subjects is quite marvellous. We think, without exception, this is the choicest and most beautiful photograph we have ever seen." Praise of this kind from an accomplished art critic is gratifying to all photographers who are proud of the triumphs of their art.—ED. PHOTO. NEWS.

* *Photographische Correspondenz.*

* As any comment on the picture itself is manifestly inadmissible from Mr. Robinson's pen, it may probably interest the reader to know how such a picture was received, seven or eight years ago by the art critics of the outside press. The *Illustrated London News* had the following remarks on the picture when it first appeared:—

"A HOLIDAY IN THE WOOD": Photograph from Nature. By HENRY P. ROBINSON.

"PHOTOGRAPHERS are every day making determined efforts to apply their art as a direct means of producing original pictorial compositions, showing the mind and will of the artist instead of the mere accidental condition of



laid one upon the other in the dish until the whole number of negatives has been completed.

I now proceed to intensify by means of two solutions prepared as follows:—

1. Two ounces sulphate of iron dissolved in 3 pounds of water, and filtered.
2. Half an ounce of nitrate of silver dissolved in 20 ounces of water.

The first plate is taken from the water bath, and if, on inspection, more density seems desirable, it is treated thus:—

The negative is first rinsed in clean water and allowed to drain for ten or twelve seconds, and solution 1 is then poured on; the liquid is allowed to flow equally over the plate, and when the latter has been sufficiently impregnated with it, the negative is again drained. Solution 2 is now applied in such a manner that it is made to cover the surface quickly and evenly. The manner in which the iron solution acts upon the nitrate, changing the latter into metallic silver, and thus strengthening the image, may be easily observed during this operation.

By proceeding in this manner the most successful effects may be obtained, as the operation is carried on in the light, and may be repeated as often as necessary, until the desired amount of density is obtained. The shadows remain very deep, the lights are brought out, and yet the picture does not become hard or possessed of too much contrast, as is often the case when pyrogallic acid is used for intensifying.

To those who employ hyposulphite of soda as a fixing agent I would strongly recommend the placing of their negatives, after fixing, for some time in filtered rain or river water, as by this means the fixing material, and especially soda, is totally removed, whereby the film is guaranteed from splitting after it has been varnished; for it is well known that such plates are most liable to injury in this manner which have been insufficiently washed, from the fact that the trace of cyanide of potassium or hyposulphite of soda still attached to them is apt to absorb moisture from the atmosphere.

Formerly I always used soda as my fixing agent; but I now use cyanide of potassium, the employment of which I certainly recommend to all photographers. Many gentlemen would, no doubt, object to keeping plates for a whole day in water, for fear of the collodion film becoming separated; but my experience goes to prove that only those films are liable to separation from the glass where the collodion has been poured upon an insufficiently cleaned plate, or where the collodion used has a tendency to become acid. As a matter of course, care must be taken not to employ water for washing which is even slightly acid.

Correspondence.

A BUNDLE OF OLD LETTERS.

ALBUMINIZED PAPER AND PRINTING—NORTH AND SOUTH LIGHT—PHOTOGRAPHY AND PERSPECTIVE.

SIR,—Time flies apace. Here we are in November; only two months more, and then for another year!—then for the anxious watching for the lengthening of the days!—then again for the glorious work out of doors, over hills and dales, with the summer breezes flapping the tent-cover as a delicate intimation to gnats and other winged "varmint" that the operator is at work, and must not be disturbed, even if they are hungry!

But, meantime, the winter—the long, dreary winter—has many a charm to the photographer. There are the glorious meetings of the societies, the reports of all that was said and done at them in the journals, and then, a week or two later, the clumsy cribs from more respectable papers by the little ones, who are as yet too small to have reporters of their own, or who are too fierce, or unfair, or untruthful, in their juvenile enthusiasm, to be allowed to send reporters to the meetings. All

this is great fun to those who take a real, hearty interest in the profession. And then, too, infinite good is done by the liberal discussion of various topics which are turned up from time to time, either in the papers or the meetings of the societies.

I do not think that as a profession photography would get on well without the winter. It is a time of comparative rest; a time when one can sit down quietly at one's own fireside, and think over the next year's pictures; when the study of art can be continued with so much advantage from books; when comparisons can so well be made between what the work of the year has been, and what it should have been. Winter should, in fact, be a time of repentance for all the sins and failings of the past, and also a time for making high resolves for the ensuing season.

Besides all this, however, winter is, above all, the time for recording the experience gained during the season which is past; and I hold it the duty of all who wish to promote the advancement of our art freely to tell, for the good of others, all the experience they have gained, and especially when their gains have been in a great measure the result of the liberality of others. There is no photographer of position or ability in the art who would not thank even the humblest operator for a suggestion which might prove useful, and therefore none need fear, however small the amount of information they may have to communicate, for it is sure to be accepted with kindly feeling by all those whose acceptance is worth the having. It is only those ignorant snarlers who have never made a suggestion worth listening to who try to decry everything which does not emanate from their own little pens; who, incapable of understanding topics of general interest, are bound to keep secret processes and improvements which they cannot explain; or who, having found a process in full and successful operation in the hands of others, hasten to relieve them of their burthen of credit, and to claim the invention as their own.

But to turn to the matter on which it was my intention to write. Several letters have recently appeared in various papers, in which matters of which I have spoken or written have been referred to with various degrees of approbation or disapprobation, generosity or ungenerosity, according to the character of the persons who wrote the letters. I will only refer to some of these.

My first shall be the letter of Mr. Bovey in last week's News. Mr. Bovey is a gentleman whose acquaintance I have not yet had any opportunity of making personally. I esteem him as one who has a decided opinion of his own (and that, in these days, is a matter of great consideration), and as one who will put forward his opinion boldly and without fear. I was certainly not aware before last Friday that I held so high a place in the esteem of this honourable member of our profession, nor had I the faintest notion that in my paper before the North London Society, on November the 7th, I made such a complete shipwreck of my reputation in his eyes. A careful perusal of Mr. Bovey's letter shows me, however, that I am not so far in the wrong as he would imply. In the first place, Mr. Bovey has mixed up in his mind my paper and the discussion which followed therefrom. I did not start the discussion, and, as far as I remember, I only took a very limited part in it. I said nothing about salting formulae, nor do I wish ever to know anything at all about them. The question of formulae cropped up in the discussion, not in my paper. I do not care a pin whether there are ten or twenty grains of salt in a sheet of paper, so that it works to my satisfaction. I did, however, in the discussion, admit that to know the equivalent quantity of salt in the paper would be a matter of convenience, as a means of knowing how much silver was used from the bath by each sheet. What I want in practice is, a paper that I can depend upon for a certain class of work, not only from one maker, but from all makers. As an instance of what I mean, take the following little bit of experience. When M. Adam-Salomon was in this country some time back, he paid us a visit at Tunbridge Wells, and Mr. Robinson secured a very fine "Salomon-sized" negative of him. To print from this negative in perfection we used a sample of Rive's paper sent us by Mr. Bovey himself. The Saxe paper sent from the same quarter would not, with that particular negative, give us the same quality and richness of tone, and no other paper of any other maker which we have yet tried will give the same result absolutely. Now, if we take a negative much weaker than the one I have referred to, and another much stronger, and print them on the Rive's paper I have mentioned, we shall not find the quality o

the result so good as the Salomon; therefore, we knew that in order to produce the same effect again we have only to make a negative of the same intensity, and print it on the same paper; in fact, keep up the same conditions, and all is right. If we make softer or weaker negatives, we have to use another paper to get the best result. Mr. Bovey says that a skilful printer can from one sheet of paper and one negative make half a dozen different kinds of prints. Many photographers know to their cost that much less clever printers than Mr. Bovey can do the same, and do it every day, too; but I venture to say that *one* of the half dozen will be better than any of the other five. Now what is wanted is, when a ream of paper is sent out, *some idea* of how much silver it will consume to excite it, and also what class of negative will best print upon it. Photographers, when they needed the information, found that a few pelite notes, stating that unless collodions were dated they would deal elsewhere, or go without, seen brought the date neatly stamped on the bottles. It will be the same ere long with paper albuminizers. They, too, when asked, will give us the information we require.

Turning from Mr. Bovey and printing matters to the consideration of negatives, the form of glass hence is a subject of continual discussion. I do not intend, however, to enter upon any detailed consideration of the various remarks which have been made upon my article on north light. I would prefer making a few general observations on the subject. In the first place, I do not think it can be a necessary condition of success in portraiture to place the sitter in an abnormal position in regard to external things. That cannot surely be the best form of studie which involves the painting of the walls black. No one by preference would sit in a room with black walls. Then why, in order to be photographed, should one be put in a black hole? My idea of a studio is *a room*, not a place where people may only come for a minute or two, and then with a feeling of mystery and awe, as if it were something wonderful. With regard to the amount of light from the north in comparison with the south, as I have had no experience of the latter I am not able to give a decided answer; but I can say the time that pictures take with a well-arranged north light. The longest exposure ever given yet in our studio was forty-five seconds, which only happened on one occasion, and that was on a dull afternoon, with a picture which, from its peculiar arrangement, required the use of a very small stop in the lens, and 10 by 8 plate. But this is very much the longest exposure we have ever given. We often take 15 by 12 portraits in fifteen seconds, and twenty-five is the longest time ever given practically to any sized picture. Carte-de-visite pictures usually take from five to twelve seconds, and never so much as sixteen seconds. From these facts it will be seen that though the light may come from the north, there is no reason why it should involve slow working in the studio; indeed, quite the contrary, for I believe that a rapid exposure and mere general lighting are capable of producing better results than long exposure and that quality of lighting which is obtained by an intense beam of light with no reflections in the room.

Before closing the present chapter, I must allude to the courteous letter of Dr. Anthony. The letter which this gentleman published in the *News* of the 9th of October was certainly to some extent condemnatory of my argument. However, I only proposed the looking-glass experiment as an illustration of a general principle, and not as being of itself absolutely accurate. It seemed to me a convenient manner of showing an increase in the amount of perspective, distortion, or enlargement, as the distance from which the object is viewed is lessened. Dr. Anthony was certainly right to correct an error when he saw it, and I thank him for the open and gentlemanly way in which he wrote upon the subject. It seems now, however, from a letter of Mr. Winstanley, that the Doctor is not absolutely correct. I confess that on first reading the remarks of Dr. Anthony I did not see his error, probably because I did not see my own; it was near enough for me to illustrate a general principle without entering into absolute accuracy of detail. However, I am glad to find I am right after all; and I would take this opportunity of thanking Dr. Anthony for his kind and honourable letter published in the *News* of last Friday. How much better it would be for photographers generally if all acted on the noble, generous principle adopted by this gentleman, which stands in fine contrast with the conduct of some hangers-on to the profession! There are said to be black sheep in every profession; but I fear in photography

there are a few in it—or hanging on to it, like parasites—more like wolves in garments darker than black velvet.

NELSON K. CHERRILL.

1, Grove Villas, Tunbridge Wells, October 31st, 1863.

A PHOTOGRAPHER'S RELIEF FUND.

SIR,—In compliance with your wish in a recent "Answer to Correspondents," I send you a few brief remarks on points which I think deserve consideration in connection with any effort to establish a Photographer's Relief Fund. For brevity's sake, I will put a few points categorically.

1. Is the time ripe for such a thing? I do not say it is not, but I want the matter considered; and when I ask, Is the time ripe? I mean, Do photographers form a sufficiently distinct, numerous, and consolidated body to make the formation of a provident society solely on their behalf desirable and practicable? Trustworthy statistics are not readily accessible, but it is well known that in the provinces a considerable number join the profession of photography to some other trade, such as chemist, bookseller, actor, carver and gilder, hairdresser, &c. Would these contribute to a provident fund, or would they be fit candidates for the aid of a photographer's benevolent fund? I do not say they would not, but the questions are worth consideration.

The transitional stage which photography, as a profession, at present occupies, and to which you have already alluded, is another reason for asking, Is the time ripe? But I need not further dwell on that part of the subject now.

I am led especially to ask, Is the time ripe? by another consideration. I have just been referring to my back volumes of the *News*, and find that it is four years since you first mentioned the desirability of forming such a fund, and pointed out its importance in very forcible terms. Since then it has been advocated from time to time in articles and letters, but not one practical step has been taken to realize the idea. If the time were ripe, and photographers really believed in the importance of the thing, surely some attempt of a practical kind to embody the idea would have been made ere now.

2. If the formation of some fund be desirable, surely it is of the utmost importance that the nature of the organization should be first discussed, if not determined. That discussion can be much better managed by letters in the journals, if you, sir, will give space for such discussion, than it could be at committee meetings, should a committee be formed to manage such a matter. I think that it is very desirable that we should have the opinions of at least some of the representative men in photography on such a subject. To aid in determining such a question, statistics are of vital importance. Are there any means of obtaining trustworthy figures as bases of calculation in such a matter?

3. If it be determined, on consideration, that some benevolent or provident organization is desirable and possible, and that the time is ripe, how is it to be initiated, and who are the men to do it? Here comes the practical difficulty. After the fullest discussion in the journals, personal effort will be required, and that effort must be made by trustworthy men. I once knew a project of the kind fail because one of its chief advocates was a man notoriously in debt, in a chronic state of insolvency, and no one trusted him or any scheme he advocated. In photography we have men of great ability and unimpeachable character. Will they undertake the hard work of beginning? "Twere good they did so much for charity," and I think that if a good plan were projected, good men would not be wanting to carry it out. All such action must have a beginning, however, and this necessity is often difficult to meet. Two possible ways occur to me of beginning: First, if the Photographic Society of London could undertake the matter, and appoint a committee to take steps, I think the organization might be secured; or, second, failing this just named, if you would open a subscription list, eventually a committee might be formed out of the subscribers.

4. Finally, if the time has not come, or photographers are not sufficiently numerous to form a provident or benevolent organization of their own, is it possible for them to join some cognate body already established for the purpose of relieving some class? Existing provident societies would, of course, accept them, but would some benevolent association accept contributions especially endorsed for photographers, and undertake to administer to indigent photographers in the ratio of their necessity and of the extent of funds available for them?—Your respectful reader,

STEREO.

MR. FRY'S METHOD OF MASKING.

SIR,—My attention being attracted to the leader in last week's NEWS, I at once proceeded to put in practice the suggestion communicated by Mr. S. Fry. Having a negative that had been intensified with mercury, and which by constant exposure to the light in printing had become unmanageably dense, and having some time ago obtained a transparency from it, I placed the transparency over the negative as directed, and was delighted to find that this, like many other suggestions of Mr. Fry, is a really valuable one.

Should this hasty note be considered worthy of insertion or notice in your columns, my desire to serve my brother photographers will be answered. I enclose a print, that you may see the effect.—I am sir, yours truly, H. C.

October 27th, 1868.

[The print enclosed is an admirable illustration of right application of the principle of masking referred to; and a round, delicate, and well-modelled print has been obtained from a hard negative.—ED.]

DEAR SIR,—The letters of "R. F." and "Zeta" are both founded on erroneous premises. Each assumes, in the first place, that my invention for masking negatives is theoretical only, and also that it is intended merely for the improvement of bad or too hard negatives.

First, then, I have used it in my ordinary portrait practice for about eight months with great advantage and high appreciation from the public, and it has created an entirely new branch of business with me, although no announcement of any speciality has ever been made. If your correspondents will write to me, a specimen of the result shall be sent to each. I think I have shown that this is a simple, practical business matter.

Second, with regard to the negative, I find the finest negatives are most amenable to this method. The difference between a print before and after treatment is very great. Take a small transparency of a negative, and a paper print from the same, the difference in detail is enormous; this experiment exactly illustrates the difference in value between a plain print and one treated according to my method. Should any further information be necessary, I shall be happy to afford it.

Specimens of the results of this method of working, with the negatives and also the transparencies employed, will be exhibited at the exhibition next Tuesday, at Conduit Street. I am not a producer of specimen pictures, and therefore those shown will be the results of ordinary business work. The application of the transparency at the proper place and time is as simple as possible, and is readily effected as an ordinary detail of printing. As a matter of private opinion, I never by any chance entrust printing of negatives to any but thoroughly qualified persons who have undergone a long and careful training under my own eye and according to my own notions. I do not believe in letting just any one do it.—Yours faithfully, SAMUEL FRY.

Surbiton, November 2nd, 1868.

TO STRENGTHEN VARNISHED NEGATIVES.

DEAR SIR,—The best method of giving additional density or printing power to varnished negatives which may be somewhat wanting in these qualities has sometimes been discussed in your columns; but a plan I have lately adopted with much success, and which, in my hands, is simple, efficient, and does not destroy half-tone, I have not seen mentioned. I claim for it no originality, for it is almost too simple not to be well known and often practised. I seldom have to alter any negatives, but occasionally it is desirable to modify them; and when I err in intensifying, it is generally on (I fancy) the safer side of not carrying it quite far enough. A ready method of adding intensity to a varnished negative is no doubt a valuable reserve power to have at command.

A varnished negative that needs strengthening is to be treated slightly with spirits of wine, but not absolute alcohol, for that dissolves the film, as does also the impure methylated spirit. When dry, the surface will be dull, and the intensity of the negative much increased. I enclose two prints illustrative of the effect; the one taken from the negative before alteration, the other after.

The other carte portrait—the little girl sitting—is a specimen of my gold and mercury intensifying process pure and simple.

It is a very delicate intensifier, and in the case of a thin negative should be followed by a weak solution of iodide of potassium.

These hints are at your service if you think them worth publishing in the NEWS.—Yours truly, C. T. WINTER.

Cheltenham, November 2nd, 1868.

[The difference between the prints taken before and after the treatment described is marvellous. Before treatment, the negative yielded a poor, feeble print; after treatment, the print obtained is brilliant, round, and vigorous, without loss of delicacy. The print from a negative intensified by the gold and mercury solution, which Mr. Winter has before described in our columns, is very admirable.—ED.]

PROPORTION OF SALT IN ALBUMINIZED PAPER.

DEAR SIR,—I have often been struck with a singular propensity in the tradesmen I may happen to deal with, to know a great deal more about what I want, or what I should want, than I know myself. My tailor tells me, when I remonstrate with him for making a garment contrary to orders, that "it is worn so." My butcher replies to a remark that the joint is too fat, that "the fat is the best part of the meat;" and so on with regard to almost everything used in domestic life.

Well, sir, in these matters I grin and bear it; but when the same practice is applied to the tools or materials of my profession, I feel disposed to make a stand against it. At one time my optician met my request for certain improvements in lenses by a brusque reply to the effect that photographers must improve their processes, as the lenses were perfect. *Mais nous avons changé tout cela.* But now albuminized paper makers seem disposed to adopt the same tactics. At the North London meeting Mr. Hart complimented photographers by saying that nine out of ten of them could make no use of the knowledge of how much salt was used in their albuminized paper, as though that were a justification of the practice of withholding the information from those to whom it was valuable.

Mr. Bovey goes further still; and because Mr. Cherrill has ventured to wish for some uniformity in the quality of paper, and some knowledge of the amount of salt used, to guide him in making and strengthening his nitrate bath, Mr. Bovey tells him that he is incompetent and inexperienced in printing. I fancy that is not true; but if it were, it would only be a stronger reason for supplying information to aid the inexperienced printer.

Now, sir, I respect and esteem both Mr. Hart and Mr. Bovey very highly. Mr. Hart has often published valuable suggestions in your pages. Mr. Bovey's practical articles are full of valuable matter; he is only dangerous when he loses his head and gets into wordy rhapsodies. I have used the paper of both gentlemen, and know it to be excellent. But is it not too bad that I cannot ask a reasonable question without being told by one that I cannot make any use of the information I seek, and by the other that I am incompetent because I ask it?

I think, on reconsideration, that both these gentlemen will feel that they have been less considerate to photographers than is wise, polite, or politic.—Yours, sir,

ONE WHO DOES NOT LIKE TO WORK IN THE DARK.

PORTRAITURE "ON APPROBATION."

SIR,—My object in writing to you is to protest against the custom which appears to be creeping in of taking portraits on approbation.

People come and occupy your time for an hour or two, as the case may be, pay nothing, and request that "proofs may be sent." They reject the whole as "not approved," although as photographs they may be unexceptionable; and, when expostulated with, say "it is the practice among other respectable photographers, and that of course they cannot think of paying for portraits they do not like. This has happened to me more than once of late. Truly photographers are their own worst enemies.—I am, sir, yours obediently, GEORGE DOWNES.

Bedford, October 28th, 1868.

THE PHOTOGRAPHS OF THE LATE ECLIPSE TAKEN IN INDIA.

SIR,—With reference to an article that appeared in your impression of the 23rd. ultimo, entitled "Failure of Photographing the Eclipse in India," in which you have unjustly

expressed an opinion that the photographers of the Royal Engineers detailed for that expedition were not "experienced" in the art of photography, I beg to inform you that Sergeant Phillips, R.E., the senior photographer, has been employed in Palestine on two expeditions under the auspices of the Palestine Exploration Committee, and that his name is well known in connection with the photographs published by that Society. He had, therefore, great experience of photographing in a hot climate, but, in common with other photographers, he had not had much experience in photographing eclipses, especially in cloudy weather.

I may add that Major Tennant has expressed an opinion that his six negatives are equal in scientific interest to any that have been obtained in Spain, and he has valued them at £150 each.

The following extract from the *India Gazette* speaks for itself:—

"The services of Sergeant Phillips, and Sappers Talbot and Conway, of the Royal Engineers, have been great. They have had a good deal of hard and harassing work in making everything ready. Sergeant Phillips, in particular, has been most useful, and I have much of the success of all preparations to thank him for. The partial failure of the plate operations has been from causes beyond these men's control, and I would respectfully solicit that His Excellency in Council would be pleased to grant a month's donation of pay to each.

(Signed) "J. F. TENNANT, Major R.E."

"As recommended by you, His Excellency in Council sanctions the grant of a donation of one month's pay to Sergeant Phillips, and Sappers Talbot and Conway, of the Royal Engineers."

In conclusion, I may be permitted to add that even if this "comparative failure" had been the fault of the men, this would not have been logical ground for hinting that the Royal Engineer photographers are "not familiar with photographic operations." Lord Napier, in his despatches, repeatedly mentioned the success obtained and good service rendered by the Royal Engineer photographers under most trying circumstances in Abyssinia. In that expedition photography was the field printing press. Staff officers' reconnaissance sketches brought in during an afternoon were at once photographed, and reduced to a uniform scale during the operation, in order that different sketches, if they overlapped, might be subsequently joined together. The sensitized paper was prepared during the night, and impressions struck off in the morning. The prints were finally mounted on linen, and distributed throughout the force. This was the principal work of the photographers, who had also to take care of the mules, carry their arms, and march as other soldiers. In addition to the large collection of negatives of plans, they have brought home a most valuable collection of about eighty negatives of general views, prints from which will be exhibited before the Photographic Society this month. Sergeant Harrold, R.E., the senior photographer, shortly before taking the interesting views of Magdala, was detailed as one of the storming party, and for his conspicuous gallantry at the assault of Magdala has obtained a medal for distinguished conduct in the field.—I am, sir, your obedient servant,

S. ANDERSON, Lieut. Royal Engineers,
Assistant Instructor in Photography, &c.

Royal Engineer Establishment, Chatam, Nov. 4, 1868.

[We are glad to learn that the photographic operations in connection with the recent eclipse observations in India were more successful than the first report indicated. Our correspondent must remember, however, that our remarks were based upon the statements of Major Tennant himself, who described the whole of the plates as "covered with spots," and as "showing but faint traces of the corona;" and he attributed this to the "concentration of the nitrate of silver solution" by heat. Now this is a condition of things in no wise attributable to the eclipse. It could only have arisen from want of care or want of knowledge, and it is fair to assume that it was to lack of experience, and not any more culpable cause, that such a result was due. If we do the Engineers in whose care the photographic operations were placed any injustice, we regret it, and can only point to Major Tennant's report, and the contrast furnished by the results of the German expedition, in justification of our remarks. Our correspondent mistakes us in fancying that we imply that skilled photographers are not to be found amongst the Engineers. We have before spoken highly of the skill and success of Sergeant Harrold in Abyssinia, and we have had reason to believe that it was owing to the absence

of the most accomplished Engineer photographers in Abyssinia that less able men were at the service of Major Tennant's expedition. In our allusion to the Engineers we merely put a hypothetical case, saying *if* the men told off were not familiar with photography, &c., &c. It is much more pleasant to us to believe that this expedition was in some degree successful than that it was a complete failure.—Ed.]

Talk in the Studio.

OBITUARY.—We regret to announce the death of another of the old and valuable workers in photography. Mr. T. A. Barber, an able chemist, well known at one time as one of the most active and useful members of the North London Society, died on the 29th ult., aged fifty-three. Some excellent contributions to the chemistry of photography by Mr. Barber will be found in our former volumes.

PHOTOGRAPHY AND POPULARITY.—The Russian correspondent of a daily contemporary regards photography as a tolerably accurate gauge of popularity. He says:—"The coming of Mdlle. Patti is looked forward to with vast impatience by the opera-going world, and photographs of the *Diva* already inundate the shop windows; while Lucia, about whom all Petersburg went crazy last winter, is relegated—in photographic form at least—from the 'line to a higher region.'"

PHOTOGRAPHY AT THE HAVRE EXHIBITION.—The *Standard*, speaking of English photography at the Havre Exhibition, says:—"This last (photography) is an art upon which the French, with dominant vanity, plume themselves. Our specimens at Havre were few, yet they are admitted to be scarcely less than incomparable. Now it might be invidious to select the names of individuals or of firms without analysing the entire list; but upon examination it will be found that out of three thousand exhibitors—a very small proportion being British—a magnificent allotment of awards fell to our share."

"SCIENTIFIC OPINION."—The first number of the new issue of this interesting resumé of news on current science is just out, and promises well. It contains a capital selection of articles from the scientific press generally, at home and abroad; brief but sufficient notices of the proceedings of scientific societies; reviews, correspondence, and condensed information in the shape of "Notes, Queries, and Memoranda." It is well edited, and, as it fills a new field, it will, we doubt not, become a favourite with the scientific public.

FINE CLOUD EFFECTS.—Mr. H. Sampson, of Southport, has favoured us with stereographic examples of two magnificently fine cloud effects, in which the sinking sun is behind grand masses of cumulus cloud, the edges of which are gilded by the light, which also streams in fan-like rays beneath, and is reflected in the sea. A tiny vessel forms a touch of black just in contact with the most brilliant light, and is very effective. Mr. Sampson says:—"I have pleasure in sending to you by this post a couple of cloud effects, taken on the evening of 7th ult., therefore, as you will see, 'storm clouds.' At the time they were taken the wind was blowing strong from the south-west, so as to require three of us to keep the camera rigid; during the night heavy storms of hail fell, which continued at intervals for eight days. I have several others taken the same evening, but send these two as being most effective." The practice of securing passing effects is one highly commendable, and should be followed by all who have opportunity.

To Correspondents.

H. S. R. H.—The fault in your transparencies is the presence of a deposit in the portions which should be clear glass. This deposit may arise from over-exposure, or from fog. In transparencies for the lantern, the parts intended to be white should be represented by bare glass, not by the grey, foggy deposit present in yours. This deposit obstructs light, and prevents a brilliant image being thrown on the screen, especially when using a paraffine lamp as the source of illumination. Give a shorter exposure, use more acid in your developer—or use the gelatino-iron developer—and take especial care to avoid the presence of diffused light in your camera or dark room. One of the transparencies was broken into a score of pieces. It is not safe to send glass through the post unless packed in a box. If a couple of strips of wood had been attached to the packing boards employed, so as to bear off any pressure, and practically form a box, there would have been no danger.

VENATOR.—The exhibition will remain open for a week, and the public, after Tuesday evening, will be admitted free. 2. The best remedy we can suggest for turbid collodion is to allow it to stand, and then decant off the top portion. 3. When wax is applied to a plate of doubtful cleanliness to give it a thin film of a neutral substance, it is simply necessary to apply the wax solution, and then rub it nearly all off with a clean cloth. After it is so treated, it will generally yield a clean negative, although it will not look even and clean when breathed upon. A preliminary coating of albumen causes risk of injury to the silver bath.

PETER SIMPLE.—Without some slight preliminary knowledge of the subject—such, for instance, as a knowledge of what an enamel is—we fear that you will not succeed in producing burnt-in pictures. An enamel picture is a picture formed of vitreous colours which have been submitted to sufficient heat to slightly fuse them. A “flux” consists of a mixture of powdered flint and borax, or similar materials, which readily vitrify under the action of heat. A flux is added at times to the colours used to aid in the process of vitrifying. Porcelain colours generally consist of metallic oxides, which assume a vitreous form under the action of heat. Vitreous colours, fluxes, and enamel tablets can be purchased ready for use. We cannot tell you where; but your London dealer will doubtless procure them for you. Our Fifth Volume contains a good deal of information on the subject of enamels.

WM. CORBOLD.—The pinholes in your case most probably proceed from excess of iodide of silver in the bath. To test this, take an ounce of the bath and add half an ounce of distilled or boiled rain water. If your silver bath be already saturated with iodide of silver, this addition will make it turbid. The remedy is to dilute the whole bath with an equal bulk of water, and then, after filtration, add sufficient nitrate of silver to bring the solution to the proper strength.

W. J. A. G.—You will best understand the directions for developing the dry plates if you bear in mind the respective offices of solutions 1, 2, and 3. No. 1, the pyro solution, is the developer proper; No. 2, the ammonia, aids the action of the pyro; whilst No. 3, the bromide, retards somewhat, its especial function being to prevent fog. These are mixed in the proportions indicated for the purpose of bringing out the image; and when this is effected the pyro and ammonia are used to secure intensity. The bromide will not aid in this, and should not be used unless there is some tendency to abnormal deposit on the shadows, in which case a little of it may be added. We have found, as a rule, that dry plates were not satisfactory with any amount of exposure in a bad light, and we should recommend you not to waste time and court disappointment by exposing dry plates except when the light is clear and bright.

GULIELMUS.—As you have, as you state, carefully read all that has appeared in the *News* on the subject of pinholes, it is difficult for us to give you any fresh information. Your remark that your difficulty generally occurs during the process of intensifying suggests a possible remedy. We have found pinholes occur in intensifying from several causes: where, from thinness in the image, or from under-exposure, the intensifying has required pushing considerably; where a portion of the nitrate bath is added to the pyro instead of a fresh solution; and where excess of nitrate has been added to the pyro. Aim, by the use of suitable materials and full exposure, to get a good image in the first process of development, and the risk of pinholes will be much reduced. Either citric or acetic acid may be used; but we are not aware that any difference in the result, as regards pinholes, will follow. 2. The different statements you find as to the proportion of silver taken up by a sheet of albuminized paper doubtless arise from the use, in the experiments recorded, of different samples of paper, in which different proportions of salt have been used. The proportion of silver absorbed is chiefly regulated by the proportion of salt added to the albumen; and as the proportions used by different persons vary from 5 grains per ounce to 20 grains per ounce you will see how impossible it is to give any general statement on the subject. The following calculation may help you:—One sheet of paper takes up nearly an ounce of albumen solution. Suppose it contains a proportion of 8 grains of chloride of ammonium, the salt on a sheet of such paper will take up about 25 grains of nitrate of silver, the albumen will take up a little, and the solution on the surface, suppose it to be a 40-grain bath, will amount, probably, to 10 grains more. In such a case you would have nearly 40 grains of nitrate of silver consumed by one sheet of such paper. We are glad our last advice enabled you to remove your difficulty.

J. SMITH (Halifax).—Grasshoff's Manual of Instruction for Retouching Photographs is published in German, by L. Gerschel, Berlin.

M. A. WANDERSON.—We do not know of any one who makes a collodion specially for enamelling photographs, except Mawson and Swan. To make some for yourself you would probably require to make the pyroxylene also, as toughness much depends on the character of the pyroxylene. It should be made with moderately weak acids, and at a low temperature.

LUX ET SALUS.—Thanks. You will probably have opportunity of calling on some other occasion. Your letter in our next.

J. T. (Fife).—Either Mr. Bovey's toning bath, the lime bath, or the acetate bath will, as a rule, answer; but double albuminized paper is generally somewhat slow in toning. If you immerse the prints in the toning bath without previous washing, or with but slight washing, they will tone more readily.

Z. H. A.—The formula you state will yield you a good solution of chloride of gold; but as it contains a large proportion of acid, it will not be suitable for use with an acetate bath. Your best plan of using it will be to neutralize the portion required with chalk, whenever you wish to use it, a few hours or a day beforehand. If you want it for immediate use, neutralize with chalk, and add to an ounce of the solution 5 ounces of hot water; when cool, it will be fit to use. It will always require a few ounces of water adding to each ounce, as the strength you name, $1\frac{1}{2}$ grain per ounce, is much too strong for toning purposes. 2. The story is a myth. Publishers of engravings generally get as good a subscription list as they can before publishing a costly plate; but they are under no legal obligation to destroy the plate at any time. They sometimes make a compact with subscribers that the plate shall be destroyed after a certain number have been printed, with a view to prevent the subject becoming too common; but this is purely a matter of choice. The notion that Graves and Co. make money by prosecuting pirates is very foolish. They have been, perhaps, a little vindictive in these prosecutions because they have been much wronged, and suffered much loss.

PHOTO.—Marion and Co. are the largest photographic publishers. The Stereoscopic Company also publishes largely. C. E. Elliott, Spooner and Co., and some others, both publish photographs and deal in them; but we cannot furnish you with anything like a complete list of such publishers. 2. If you develop your solar camera image sufficiently, then wash, and immerse in an ordinary hypo bath, you will not lose the image.

W. T. WATSON.—Received. Your request shall have our attention. The specimens are very good. We shall have pleasure in learning further particulars of the mode of producing them.

B. A. GILBERT.—Acetic acid once added to a silver solution is very difficult to remove. Nothing short of boiling to dryness will effect it thoroughly.

E. SAWYER.—We ascertain from our correspondent that your pictures arrived at Falmouth two days after the opening of the Exhibition, and as his notice was written on the first day, no notice of your contributions was possible. Those to which you refer as possibly yours were both by Mr. Douglas, of Edinburgh. Our correspondent, speaking of yours, states that they are superior to the average of coloured enlargements, and that the likeness is admirably preserved.

“PERMANENT PHOTOGRAPHY.”—A correspondent has sent us a paragraph cut from the *Daily Telegraph* with this heading, with some severe strictures upon what he terms a “shameless puff of Poncey's process,” and his claims to the origin of carbon printing. The subject is not worth re-discussion. It has been thoroughly canvassed in our pages more than once, and we have shown that M. Poitevin produced carbon pictures and patented his process three years before Mr. Poncey was heard of. The oil or printing-ink process has many good features, and we have seen good results produced by it. It is a pity that a good process should be prejudiced by the injudicious claims of its inventor. Six hours' boiling, and six days' baking in a furnace, are burlesque tests, and are of no value if true.

F.—Thanks: in the main you are correct. We simply answered two specific points raised by our correspondent; we have no concern with common gossip or its retailers, nor should we dream of having any discussion with persons who do not hesitate to invent their facts and their correspondents to meet any case. We are familiar with the aliases you mention, and many more; but neither they nor their owner possess any interest for the public.

A. B.—The plan of iodizing by the addition of a little collodion to the bath is not to be commended. The pinholes in your first essay are probably due to that. So far as we can see, there is not much defect about the second bath. It is difficult to say from which of two or three causes the fog may arise. It may be that a little more nitric acid may be required in the bath; there is not much danger of adding excess when you are using bromo-iodized collodion. It may be the want of a little more acid in the developer. Possibly the use of the gelatino-iron developer would meet the case. The fog may possibly be due to the presence of a little white light in the camera or dark room. It has somewhat of that effect. Try excluding white light carefully, and try the gelatino-iron developer, and let us know the result. We are glad our advice helped you out of toning difficulties.

DEALER.—You need be under no apprehension. The first clause in the new Act, from which we made an abstract some months ago for our readers, distinctly states the date of its operation as “from and after the 31st of December, 1868;” and no “judge” has stated anything to the contrary. A blunder on the subject was made in a police court, which has been perpetuated by some of the more careless or less informed portions of the press. Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Exhibition of the Photographic Society	541
Simple Plan of Obtaining Plain Paper Prints	542
Our Printing Room. By Nelson K. Cherrill	542
Retouching the Negative. By Johannes Grasshoff	544
Pictorial Effect in Photography. By H. P. Robinson	546
On the Employment of Mixed Collodions. By M. Omer Bordeaux	546
On the Sensitiveness of Photographic Preparations	547

	PAGE
Proceedings of Societies—North London Photographic Association—Edinburgh Photographic Society	548
Correspondence—A Photographer's Relief Fund—Portraits on Approval—Albuminized Paper and Printers—Mr. Fry's Mode of Masking—Photography and Perspective	549
Talk in the Studio	551
To Correspondents	552

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

THE success and satisfaction which have attended the second experiment in opening the winter session of the Photographic Society with an exhibition of pictures and a social reunion of the members and their friends justify us in regarding these as henceforth established institutions, and we find in the fact the solution of a difficulty which had before seemed as insuperable as it was deeply to be regretted. The advantage of exhibitions of photographs in aiding and stimulating progress was a thing universally admitted, and the interest of such exhibitions was everywhere recognized. But the cost, as they had been hitherto conducted, was simply ruinous to the Society. Modelled, as it was natural they should be, on the principles followed in exhibitions of pictures generally, the cost was not less, whilst the income was of necessity incomparably smaller. The rent of a large gallery in a central position for a few months, with added cost of gas, attendance, printing, and advertising, amounted to a heavy sum, whilst the payments for admission from the public—members and their friends generally entering free—and the amount of commissions on sales, did not amount to the tenth of a tithe of the amount usually taken in an exhibition of paintings, in which the expenses were but little more, so that the annual loss to the Society became very serious, and it had become apparent for some years past that the exhibitions, with all their advantages, must cease.

The project conceived and so successfully carried out last year just met the difficulty, however, and an exhibition for a limited period, with simple and economical arrangements and much volunteer labour, was found not difficult to secure, when a few willing workers and influential members of the London Society took the matter in hand. The full educational and stimulating influence of an exhibition is secured, without taxing the resources of the Society unfairly and beyond the bounds of legitimate expenditure.

The exhibition which opened on Tuesday evening was beyond precedent satisfactory and pleasant. On all hands it was pronounced to be one of the best, if not the best, of exhibitions ever opened, the contributions being full of excellence and full of interest. A very large attendance of members and their friends, many of whom had come from the country to attend, materially contributed to enhance the pleasure of a reunion which every one present seemed to enjoy.

One of the first facts which strike us on glancing round the exhibition is the illustration afforded by the large number of contributions, of the healthy vitality of the art, and the unflagging interest in its progress maintained by the majority of its devotees. Here is an exhibition, an-

nounced with little circumstance, to be kept open for a week only, offering no honours or awards, yet the most able, and the most skilful, and the most successful exponents of the art, professional and amateur, are sufficiently interested in witnessing and aiding progress to produce one of the finest collections of photographs ever brought together. Some few honoured names were, from various causes, not represented, but amongst the work of about a hundred contributors were found the pictures of most of the representative men associated with the art.

The next fact which struck us, after examining the pictures exhibited, was the general excellence that prevailed. We remember that in many former exhibitions the mass of the contributions were of a very commonplace character, the examples of great merit standing out as brilliant exceptions. Here the bulk of the contributions are of very high standard indeed, and indicate a very great general advance, both in artistic and technical excellence. The progress in portraiture since last year is almost startling, and we may fairly state that we never saw so much good portraiture brought together before. As we had anticipated, the influence of the works of M. Adam-Salomon was abundantly manifested, not only in the large number of portraits in which his characteristic style was adopted, but in forms of portraiture, distinct in their characteristics from those of the great French artist.

We may remark here, in passing, and without any egotism that we feel considerable satisfaction in this result, because we have been mainly instrumental in calling the attention of photographers to these pictures, and in affording them opportunity of becoming acquainted with them. Believing that they possessed not only a higher excellence than prevailed in this country, but that they possessed some elements of excellence scarcely dreamed of as possibilities by English photographers, we felt assured that we were doing them service in pressing this subject upon their attention with a degree of iteration which risked being tiresome; and we did this because we equally felt assured that English portraitists only required the standard bringing under their attention, and the spirit of emulation awakening, to induce a resolve to hold no second position in attainable excellence. We think the result, as illustrated in this exhibition, has fully justified our convictions. It is not necessary to enter into comparisons, or estimate how far English photographers have advanced in the race for excellence; certain it is that they have attained a position which few would have anticipated twelve months ago.

It is impossible, in the brief time since the exhibition, to enter into a detailed notice of contributions so numerous and excellent, but we may briefly allude to a few names as an inducement to many to avail themselves of the remaining few days which the gallery remains open to pay it a visit. In landscape work we may mention a charming collection

of Mr. Bedford's recent pictures, and we may add the interesting intimation that the pictures are now described as those of G. Francis and William Bedford; Mr. Bedford's son promising worthily to maintain the reputation of his father. Mr. England sends a frame of the capital results obtained during the summer in the Savoy. Messrs. Robinson and Cherrill send some large landscapes with such grand clouds as are not often seen, still less often secured in the camera. Mr. Wardley sends some magnificent 16 by 12 landscapes by the collodio-albumen process. Mr. R. Manners Gordon contributes a few of the most exquisite little photographic gems ever exhibited. No one should fail to see a charming little landscape with groups of sheep, which is as nearly perfect as possible. A view of Carnarvon Castle just above it, taken with the gum process he has described in our pages, ought to be seen by all who are interested in dry processes. This plate was kept upwards of a month before exposure, and upwards of a fortnight more before development; and, notwithstanding the perfection of the detail in every part, it only received fifteen seconds' exposure. Mr. Vernon Heath sent a fine collection of his admirable landscapes. The Hon. W. Petre, a gentleman quite in his novitiate as regards photography, has sent some very capital artistic landscapes. Some mountain and waterfall scenery by Mr. Crofton Atkins, Mr. Beasley, Mr. Howard, Mr. Whiting, Mr. Brownrigg, Mr. Spode, Mr. Best, Mr. Clarke, Mr. A. Irving, Mr. Bowen, the Royal Engineers, and others, send landscapes well worth inspection.

In portraiture, perhaps, the exhibition is richest, and it would be somewhat difficult to assign the order of precedence. There is a large collection of examples of Adam-Salomon which need no comment, art qualities and technical excellence abounding in greater or less degree in every one. A portrait of M. Salomon is exhibited by Messrs. Lock and Whitfield, and another by Messrs. Robinson and Cherrill. The only other portrait exhibited by the latter firm is a magnificent Salomonesque portrait of Mr. Hain Friswell, wonderful for its life-like and fine expression. Mr. Robinson's successor at Leamington, Mr. Netterville Briggs, exhibits a collection of 12 by 10 portraits, furnishing admirable examples of the same style, one of which is the prize portrait of the Falmouth Exhibition, and which we have already noticed. Some very fine cabinet portraits with natural landscape backgrounds, and some pretty vignette pictures by a new process, styled "Emolliotype" (of which more hereafter), are exhibited by the same gentleman. Mr. Blanchard has some very satisfactory examples of the Salomon style of portraiture, brilliant, delicate, rich, and well modelled. Mr. Fry has a fine collection in the same style, which have the additional interest of illustrating the results of the mode of masking recently described in our pages. Mr. Mayland has some brilliant examples of the same style. Mr. Leake has some very satisfactory specimens. Mr. Burgess of Norwich, Mr. Slingsby of Lincoln, Mr. Fradelle, Mr. Ashdowne, and others, send some fine illustrations of the same style, some of which we must return to next week, as well as to other styles of portraiture.

In subject-pictures the exhibition is rich, but we can only now mention, as contributing interesting examples in this department, the names of Mr. Rejlander, Mr. Robinson, Mr. Twyman, Mr. Hubbard, Mr. Jewell, Dr. Wallich, Mrs. Cameron, Mr. Crawshaw, Mr. Slingsby, Mr. Rump, and others. We shall return to this subject next week.

The Autotype Company has some magnificent examples of pigment printing; Edwards and Co. exhibited many very fine, interesting illustrations of varied applications of pigment printing. Mr. Henderson, Mr. Bailey, and Mr. Barnes, and an amateur, exhibited enamels which afford satisfactory illustration of the progress which this branch of the art is making. Collodio-chlorides, coloured pictures, Piercytypes, apparatus, and many other things, must receive attention another week. Meanwhile, we may mention that the exhibition will remain open at the Gallery, 9, Conduit Street, until Tuesday evening.

SIMPLE PLAN OF OBTAINING PLAIN PAPER PRINTS.

Of late years the use of albuminized paper has been all but universal amongst photographers, in many establishments such a thing as a plain paper print never by any chance being produced. The rich, engraving-like plain prints of Heunah, with their deep, velvety blacks, are things of the past; and although a protest is entered now and then against the vulgar gloss of albuminized paper, yet photographers and the public have become so accustomed to it, and the practice of printing upon it has attained such a high degree of perfection, that it is not likely to be deposed from its present position of universality.

It happens, however, now and then, in many establishments, that a plain paper print is required for some special purpose, and the printer is sometimes under the necessity of making several experiments before he can produce anything sufficiently perfect. The enquiry not unfrequently reaches us from persons who say that they have never worked with plain paper, "How shall I proceed to get a few presentable plain paper prints?" Some time ago a sample of paper was in the market entitled "Amorphous albuminized paper," which had a matt surface, and gave all the vigour of ordinary albuminized, without its gloss. We generally recommended the use of such paper when unalbuminized prints were required, as it required no treatment different from ordinary albuminized paper. The demand for the amorphous paper has not, however, been sufficient to induce its maker to continue the supply; and we were informed the other day by Mr. Rejlander, with whom this paper was a great favourite, that it could no longer be procured.

The plan we are about to name is not, we believe, strictly new, but is, we fear, very little known. Our attention was recently called to it by Mr. Blanchard, who finds it answer admirably. It consists in floating a piece of ordinary albuminized paper on the silver bath with the plain side in contact with the solution—treating the albuminized surface, in fact, as the wrong side. The albumen and salt applied to one side of the paper appear to permeate the whole substance sufficiently to form a vigorous image on the other side when treated as we have described. The print is toned and fixed in the same manner as those with an albuminized surface. The plain paper print thus secured is rich, vigorous, and of excellent colour, and the nearest approximation to those yielded by the amorphous albuminized paper, of any plain paper prints we have seen for some time.

OUR PRINTING ROOM.

BY NELSON K. CHERILL.

SURELY by this time there are no secrets in the printing room! Surely the Photographic News and other journals have not reached their twelfth volumes and yet not have exhausted so simple a subject as printing! Still I suppose it is so, if, at least, one may judge by the vast amount of ignorance which exists in the photographic world upon printing matters. Perhaps there is another way of putting it, which is better: all that can be said of printing may have been said; aye, may have been said many times over, and yet it may never have reached the understandings of some "intelligent printers." There can, at any rate, be no harm, and may be some interest, in describing somewhat in detail the operations which are daily carried on in our printing rooms. Those who know all about it need not read this article; but I trust that there may be some one or two points worthy of note even for the wise ones.

The first operation after taking a negative, before printing, is the varnishing process. For my own part, I greatly prefer the use of hot water for the necessary warming to the old plan of holding the plate to the fire. I am indebted to Mr. England for the suggestion, by whom, if I am not mistaken, it was first made. The apparatus I use consists simply

of a zinc foot-warmer, filled with very hot water; this is placed leaning against the wall and resting on the table so as to present a sloping surface, whereon to place the negative; there is room for two $7\frac{1}{2}$ by $4\frac{1}{2}$ negatives at a time. As soon as one is warmed through, the varnish is poured on, and another plate is then put on the warmer; the plate on which the varnish is poured is well drained, and then again placed on the warmer till quite hard. As soon as the negatives are varnished, the paper for the next day is prepared (I am taking up the operation at four or five in the afternoon at this time of the year). As I lately explained in a letter to these pages, we use three sorts of paper, being one very strong, rich paper for large pictures, and also for those small ones which do not work so well on the weaker papers; another, medium quality, for general use; and yet a third, to use when prints of an exceptionally delicate character are required. These papers are known to us by the names of their makers, but it is not necessary to mention them in this place. Our silver bath consists of—

Nitrate of silver ...	...	...	40 grains
Nitrate of soda ...	...	...	20 "
Water (not distilled) ...	...	...	1 ounce
Sugar (a little) ...	...	...	<i>à la</i> Bovey.

We have tried the use of the silver bath with gelatine, but without finding much advantage from it; the above is the best formula for a printing bath that I know of for general purposes. Before use it is filtered, and about ten grains of nitrate of silver are added for each sheet prepared the day before; the strength of the bath is thus supposed to be kept up to its original standard. As I sometimes find, however, when using a quantity of weakly-salted paper, we add too much silver in this way, and then the prints begin to assume a more brilliant character, and the relation between the character of the negative and the quality of the paper becomes upset: a negative which would have printed absolutely right on our medium paper would then be too brilliant, and would have to be done on some other paper. I should also mention that we keep up the quantity of the silver solution by adding water, and if there is any reason to suppose that the bath is weaker than usual, we make up its strength, not with plain water, but with fresh silver solution.

The papers being floated on the bath for three minutes, as a rule, or five minutes in the case of very thick Rives, they are hung up to dry by two corners, so as to drain into the filter through which the bath was passed. As soon as another sheet is ready, the first one is removed to another place, and a small piece of blotting-paper is pressed against the drop of silver solution at the lowest corner. This piece of blotting-paper adheres to the sheet, and greatly assists the process of draining; besides, by absorbing the solution, it prevents any mess from its dropping about, and aids in saving the waste. The drying is finished off by the fire, and the sheets are then rolled in tight bundles, each sort by itself. Thus prepared, the paper keeps perfectly till the next day, and even to the second day, but after that it becomes very yellow, and we do not like to use it for any but unimportant work. The sugar does not, in our hands, very much aid in keeping the paper from discolouration, but it is certainly of some use, though by no means so much as we should have been led to expect from the very favourable accounts of it which have from time to time appeared in your columns.* The negatives being varnished, and the paper being prepared, the work of the day is so far finished.

Next morning the negatives of the day before are taken up to be named and looked through. The name of each is neatly stuck on the back on a slip of gum paper, and each

negative is carefully examined, not only as to its intensity, but in order to detect any little defects which may be obviated, or improvements which may be effected.

The printing operations are now proceeded with, and at this time of the year it is necessary to begin early and end early, as the light falls off very soon after the middle of the day.

There are many matters connected with the actual printing which time must compel me to abbreviate as much as possible. For vignettes we always use a simple arrangement, consisting of a hole in a piece of card, and cotton wool placed round it; this, being placed outside the frame, gives at once the most perfect means of securing a good vignette, having the especial advantages of being easily made, great cheapness, and, above all, of being easily adapted to any size or shape picture which may be required. For oval pictures we use the ready cut masks made by Mander; and nothing could be better for the purpose. One thing only is needed more with them: they should be numbered, so as to render it easier to order from them, and to refer to them, when the work is going on. We have found great difficulty in getting the makers of printing-frames to make the backboards fit properly; they generally make them so very tight; it seems to be "pride of the workshop" to make things very accurate, and so one gets punished by frames with backboards made so beautifully that you can hardly open one to look at the progress of the print without being almost certain of disturbing its position on the negative.

When the printing for the day is finished, the prints are looked through, and all extraneous dark edges of paper cut off, to save the gold; they are then immersed rapidly, one by one, in the washing water before toning. As soon as all are in, they are once turned over, and the water is then poured off, the dish again filled, and the prints again turned over; they are then removed to a second dish of clean water, and from this they are transferred, a few at a time, to the toning bath.

On some occasions during the summer we used—when printing large composition pictures, requiring some days' printing in the sun—a little alcohol in the first washing water, and with very good effect; it seemed to aid considerably in restoring the paper to its normal condition after the long-continued baking in the sunshine, and it thereby rendered the toning more certain and easy.

For toning we use the old acetate of soda bath, and until it fails us we do not intend to use any other; it is the most certain of any, and gives better tones than, or at any rate quite as good as, any that can be brought in competition with it. The amount of gold which it uses is not extravagant, but it is somewhat more than is given with some formulae. One grain of gold will, with our bath, tone two sheets of paper printed dark with massive shadows and but a small quantity of high light, such as are, in character, the pictures of M. Adam-Salomon; but when lighter prints are being made, the amount of work done by one grain of gold is more in proportion. We made our gold solution ourselves, and find it works very much better than any we could buy; it was made from pure gold and pure acids, and is a fine rich reddish yellow in solution; it does not as yet show the least tendency to precipitate from the stock solution, which we keep carefully excluded from the light. I have often heard it stated, by men whose experience should lead them to know what they are speaking about, that one grain of gold will tone from five to ten sheets of paper. I believe then it does so in a very improper manner. The object of the gold seems to me not only to be to give a fine colour, but also to make a preservative layer over the silver forming the print, and so to preserve it from the action of evil influences; and, therefore, I think it is especially necessary to use a toning bath which will ensure a thick coating of gold. One grain to a sheet used to be thought a proper proportion, but now some men are called foolish who use more than one-fifth of that quantity. For my own part, I think they are the more honest who look as

* Mr. Cherrill, we think, somewhat overlooks the nature of the service sugar is alleged to yield. It does not prevent a slight discolouration of the paper, but secures a condition in which the discolouration disappears in the fixing bath. This we find to be the general experience, even with paper kept for many weeks.—Ed.

much, or more, to the chance of a print being permanent than to its cost of production.

After the prints have been toned, we pass them through two changes of water, and they are then put into the hypo solution, which is made up of a strength of 5 ounces of hypo to a pint of water. The prints are immersed in this solution one by one, each one being turned over two or three times to ensure the absence of air-bubbles; this done, they are kept moving by rocking the dish, and occasionally by turning them over in it for fifteen minutes. They are then taken out one by one, drained, and plunged for about five minutes more in a *fresh* solution of hypo, the same strength as before. This second solution is used again the next day as the *first* fixing bath. By this process of double fixing I believe the prints are rendered more permanent than if they had only one bath of hypo. I am looking out constantly for the supply of hyposulphite of ammonia which has been promised so long, and as soon as that comes I hope to have some more experiments on fixing to report. After fixing, the prints are thoroughly washed in a dish by repeated changes of water, and are then consigned to the "washing machine" for the night. I have already described our apparatus for washing in these pages, and therefore need not again refer to it. The prints in the morning are removed to a dish of clean water, and brushed over, back and front, with a large camel-hair flat brush, to remove any little impurities which may have come upon them in the washing trough. They are then set in a heap on a sheet of glass, and sent up to be dried, first between blotting-paper, and then by being spread out on a table. Starch is used for mounting, and when waxing is required, the formula which we first tried—and which was published in the *News* in a leading article shortly after M. Adam-Salomon's visit to England—is preferred to any other. Indeed, I cannot get any other used at all, as our own is so much preferred.

RETOUCHING THE NEGATIVE.

BY JOHANNES GRASSHOFF.*

THERE are many methods extant for retouching negatives. I myself have essayed several, but shall confine myself in the following remarks to the mode of operating which in my opinion is the best and simplest, and which I have for a considerable time made use of; excellent results may be obtained with it after suitable practice, but, as a matter of course, perfection can only be secured by a sufficient amount of skill and experience.

To facilitate the manipulation of the negative it is as well to provide oneself with a retouching frame, to be had of any dealer in photographic apparatus. The frame is placed at the window, the negative is screwed into it in a slanting position, and the looking glass so arranged as to reflect the light upon the image; by this arrangement the negative is clearly and distinctly seen without inconvenience. At the same time the operator must be careful to seat himself with the frame in a dark locality, and not, therefore, in the glass room; if it is necessary to work in the evening, the mirror in the frame cannot be used for reflecting the light from the lamp, and it is best to have recourse to a light placed upon a low stand furnished with a globe of ground glass, so that the negative may be lighted up with diffused illumination.

The most difficult negatives to operate upon are generally those of large portraits, and it is the face of these in particular which especially needs attention. To render the task easier, several pieces of stout opaque paper of the same size as the negative should be provided, all of them having round or oval openings of different sizes cut into them; with these the portrait is covered, with the exception of the head (which should be visible through the opening), and thus one's sight and attention are concentrated upon that portion of the plate to be operated upon, and one is not

irritated with stray light which penetrates through the transparent portions of the clothing, &c. Besides, by this means the varnish is protected from friction, a matter of some importance if the coating is still fresh.

It has often been proposed to gum the negative after being fixed, then to retouch it, and finally to cover it with varnish. This method of operating gives, it is true, in skilful hands, very excellent results; but it often happens that in varnishing, the varnish only partially penetrates the thin film of gum, thus rendering the negative frequently useless from the spotted character of its surface. Beyond this it is necessary that especial care should be exercised in the touching up of a gummed negative, as the point of a pencil easily penetrates the film, and thus causes the formation of holes: for these reasons, therefore, it is much more desirable to do the retouching upon a varnished film.

Negative varnish which contains an appreciable quantity of shellac does not always bear manipulation with a pencil, which, in this description of work, plays a very important role; I would recommend, therefore, the employment of a varnish the composition of which I give below for the purpose; it will be found to answer admirably, and may likewise be used with advantage upon positive pictures. My formula is as follows:—

Powdered sandrac	...	...	2½ parts
Camphor, broken up small	...	...	½ part
Venetian turpentine	...	...	1 "
Oil of lavender	...	...	¾ "

The above is dissolved by means of considerable agitation in

Absolute alcohol	15 parts.
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When used, the varnish is diluted, according to circumstances, with a more or less quantity of alcohol which has been previously mixed with water in the proportion of 10 or 12 parts of alcohol to 1 of water.

The older the varnish on the negative becomes the harder it gets, and the quality of the pencil is regulated by the state of the varnish upon the plate, a hard pencil being required for a hard varnish, and *vice versa*. The first thing to be done is to work up and equalize any unevenness upon the face of the portrait, as, for instance, summer freckles and other dark spots; these are manipulated with the pencil until they are not to be distinguished from the surrounding parts of the negative; and in like manner the large shadows may be worked up, and particularly the abrupt glaring gradations sometimes seen upon negatives; strongly marked folds and other similar parts must also be softened down, in order to render the whole picture more harmonious.

Elaboration with the pencil is, however, not always successful, for in very transparent portions the lead is not sufficiently opaque, as, for instance, under the eyes, &c. In these instances a black crayon or so-called *Creta polycolor*, may be used with much advantage, being employed in the same manner as a pencil; better results still are obtained with ordinary black lithographic chalks, and, as the latter are generally very soft and the particles easily disintegrated, they impart more opacity than black lead, and answer the purpose admirably.

When these means are unavailing, a circumstance which sometimes happens when the pictures print too deeply and contain shadows of too dark and heavy a character, other methods of improvement must be tried. Ordinary black indian ink mixed with gum arabic, and used of the consistence of a syrup, may be applied with advantage. It is well to add a little glycerine to the gum in the proportion, perhaps, of two to four drops of the former for every ounce of gum solution; it then becomes easier to manipulate, and when dry is not so brittle upon the varnish, and not so liable, therefore, to peel off from the film. By using larger or smaller additions of gum, the opacity of the colouring matter may be regulated with the greatest nicety; and in parts where one coating is insufficient to render the plate of the requisite density, a second or often repeated application

* Extracted from Grasshoff's Manual on the "Retouching of Photographs."

of the pigment may be resorted to until the transparent film has been worked up to the satisfaction of the operator. One layer of colour must always be perfectly dry before another is placed over it, and care must be taken that but very little of the pigment is taken up in the brush at a time.

With this gum pigment it is possible to effect an even coating over any large surfaces which may appear too transparent, as, for instance, the hands or arms, light clothing, or hair which has not been previously treated with powder; light brown beards or whiskers which print too deeply, particular parts of uniforms or costumes, when not too large, may all be treated with this description of colour. The manner of operating is to draw a large and well-filled brush as evenly as possible over the surface, without paying very particular attention to outlines; then, after breathing upon the same, to keep the pigment in a perfectly fluid condition, a softening brush is used to distribute the colour as much as possible, to form a perfectly even coating. Some practice is necessary for this description of work, but after a few experiments the operator will have no difficulty in succeeding. When dry, the extraneous colour is removed from the outlines by the application of a moist brush.

Any spots or patches which may be present in the coated parts of the negative are afterwards worked upon and removed. By applying a thin solution of a black pigment upon the reverse side of the negative (on the glass, therefore) in certain parts, those portions may be made to print lighter; but in this manner, owing to the thickness of the glass, the sharpness of the outlines cannot be very well controlled. If greater body is required, the pigment may be used without the addition of gum. When the colour has been applied, the surface is breathed upon and manipulated with the finger until a pretty even grain has been produced. On the reverse of the negative one need not be so particular in the softening down of the colour.

For producing uniform tinting upon the negative, sap red, sap blue, Prussian blue, burnt sienna, and gummi gutti, are very frequently used, by reason of their transparency and the ease with which an even coating may be produced with them; but it is much more difficult to judge of the intensity of these colours than of black, which, when mixed with gum, is almost as easy to manipulate as the blue and red colours just named. It depends very much upon what one has been accustomed to, for when well acquainted with the character and intensity of the tints employed, the desired results are easily obtainable.

With regard to the fine pinholes and other imperfections of the negative, these are best treated with ordinary indian-ink without gum; but the moistening of the brush with saliva should be avoided, as the pigment thus loses its binding properties, and does not furnish so opaque a coating.

There remains yet to be mentioned the method for retouching negatives of oil paintings. Plates of this description are, as a rule, very difficult of improvement, especially when they chance to be of a very transparent nature. It sometimes happens that the different colours of the original produce the most startling contrasts upon the negative, and in these instances it is best to cover the whole surface of the plate with a uniform coating of dilute colour mixed with gum solution; this should be applied upon the varnished side of the negative, although in very large plates the glass side may also be coated, and when dry those portions of the picture which appear too darkly covered may be again freed from the tint by rubbing over with a moist brush or cloth.

Small imperfections in the gradation of tone may be improved by means of a lead pencil, which can be used with special advantage in those parts of an oil painting negative where the direction of the brush is traceable in the shadows and darker portions of the picture.

Finally, a few remarks are necessary on the treatment of landscape negatives. It is not always the case that the sky—or, rather, the atmosphere—is so transparent as it ought to be, and then a little aid from the brush is necessary. When, however, the atmosphere is sufficiently clear and

transparent, but somewhat detrimental to the effect of the picture, owing to its even and monotonous appearance, which is very often the case, its aspect may be improved by painting in a few cloud effects. This is best done, especially when the form of the clouds is a matter of no importance, and it is desired only to obtain a few different tints in the sky, by applying to the reverse side of the plate a little Indian ink mixed with gum in such a manner that a cloud-like gradation of tone is produced; this need not be done in a very elaborate manner, but may be roughly sketched out. By crossing the strokes, and laying one over the other, a greater or less opacity is produced, which, in the picture, will appear as light portions of clouds. A more beautiful effect may be obtained, and in an easier manner, by employing a fine black oil pigment mixed with a little linseed oil or varnish, together with a small quantity of siccativ (driers). The advantage of using a colour of this description is, that it remains longer in a moist state, and may be graduated to the finest degree, thus permitting of the elaboration of the finest cloud effects, which may be modelled from a pattern cloud negative taken for the purpose. The method of actually printing in clouds from another negative does not always yield satisfactory results, as it not infrequently happens that the clouds do not harmonize with the picture to which they have been adapted; with painted clouds an alteration can at any time be effected. Although the thickness of the glass allows of the painting being of a rough description, still the beginner will do well to soften down his work before finishing; it must also be remembered that a negative treated in this way cannot be used until the oil colour on its surface is perfectly dry. Sap red and blue are often used for painting in cloud effects, but, as previously stated, I always prefer to employ a black pigment for the purpose.

When it is considered desirable to cover over the whole of the sky by means of an opaque pigment, so that the atmosphere is represented perfectly white, red is the best colour to be used—as, for instance, cinnabar, English red, Vandyck brown, &c. A good black may also be employed. The colour is rubbed upon a glass plate as finely as possible by means of a glass rubber and water, and then some gum and a drop or two of glycerine are added; it is again thoroughly mixed to the consistence of a salve, and then placed in a saucer ready for use. But a moderate quantity of gum only should be used, and the colour, when applied to paper or glass, should not be inclined to rub off; the glycerine is to prevent the pigment from becoming brittle. The red colour is preferable for employment, as it possesses great body, and its manipulation, especially in regard to outlines on the varnished side of the negative, is easily controlled; and if any portion of the plate should not be very thickly covered or marked, the red tint prevents the transmission of light much more than a film of black pigment. Thus it will be seen that red or Vandyck brown are particularly suitable for the purpose, and also for stopping out pinholes, &c. If ordinary Indian ink is simply used for covering the sky, a pigment which in many cases is amply sufficient for the purpose, a few drops of glycerine should always be added, for reasons above stated.

It may be mentioned that instead of using gum pigments, tempera colours may be employed; these latter never separate or split from the surface of the plate, an accident which not unfrequently occurs with other pigments during great heat. Some yolk of egg is mixed with about one-third of its volume of an oil of some kind or another, and stirred vigorously in a glass vessel; a little water is also added, and then the mixture is used with the colour instead of gum and glycerine. Linseed oil, poppy oil, or Florence oil may be employed for the purpose, but linseed oil varnish is the most suitable. These tempera colours allow of the application of several layers, one over the other; one coat does not dissolve off the other so long as the first one is tolerably dry, and as the pigment is somewhat difficult to dissolve in water it should be stored away in as moist a condition as possible.

PICTORIAL EFFECT IN PHOTOGRAPHY ;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER XLI.

WHILST Turner is usually supposed to depend for his excellence upon the rendering of the more subtle and chromatic effects of nature, a careful examination of his pictures will show how strict was his adherence to the recognised laws of composition and chiaroscuro. The *Temeraire* and *Ulysses*, pictures essentially associated with the glowing effects of colour given by the setting and rising sun, yet, when reproduced in monochrome, will be seen to be singularly accurate

illustrations of the most simple forms of artistic arrangement.

There is scarcely a picture or sketch by Turner but which will afford a lesson in composition to the student, as I have had frequently to point out. This is especially noticeable in his great book of lessons, the "*Liber Studiorum*." In a former chapter an example from this magnificent work (the "*Stackyard*") was given, and in Chapter 29 I gave a sketch showing the arrangement of light and shade only of one of the finest pictures in the collection, that known as "*Norham Castle*." This drawing is so fine, and affords such an admirable lesson in effect to the photographer, that I have thought it worth while giving a more accurate and detailed reproduction of it, reduced by Mr. Fruwirth from an admirable woodcut in the *Illustrated News*, together with



the critical remarks appended to it in that journal, which forcibly indicate its chief points of excellence and interest :— " In the '*Stackyard*' we see the painter's power of imparting interest to the humblest incidents and homeliest occupations of rustic life by judicious choice of the point of view, skilful composition and distribution of light and shade, and suggestive handling—the last noticeable especially in the masses of foliage. In the '*Norham Castle*' we are reminded of Turner's marvellous versatility. Although the cows drinking at evening, the boat, the skiff, and hut are as familiar and commonplace as any of the elements of the first-named drawing, yet every one must feel that this is as different in its dominant sentiment of solemn serenity and impressive repose as it is in its leading subject of a venerable, brave, and sturdy stronghold, preserving its dignity and grandeur, and even gaining in awfulness, in ruin and decay. This drawing illustrates, also, one of Turner's most favourite expedients for securing powerful effect, with a real perspective, in which he has never been approached. We allude to the placing of a tree or building immediately before or near to the source of light. A painter thus secures not only the power of accenting the mass and contour of the

object so relieved in the most powerful way, but he obtains the utmost limit of effect by the opposition of his highest light and profoundest dark, and, by this mode of giving, so to speak, the extremities of his gamut, he enables the eye to be sensible of and measure the tenderest tones and semitones in other parts of the picture. We trust the reader will appreciate, by looking at our engraving, the variety afforded by this artistic principle to the gradations throughout, and the luminous and aerial quality imparted to the sky. Of the appropriateness of relieving against the setting sun that frowning ruin and that watchtower, which has seen the same sun sink beneath it for centuries, it would be idle to speak."

ON THE EMPLOYMENT OF MIXED COLLODIONS.

BY M. OMER BORDEAU.*

IT is by no means of unfrequent occurrence that a photographer is sorely tried by the capricious behaviour of a collodion which to-day yields unsatisfactory results, while yesterday it was perfection, and may be so again to-morrow.

* *Bulletin Belge de la Photographie.*

The cause of these variations in the results obtained are not in any way to be traced in a scientific manner by analysis or otherwise, and we have, therefore, no remedy but that of patiently bowing down before our tormentor. It is not my intention on the present occasion to make known an infallible remedy for the cure of this evil, which we all bear with more or less resignation; I desire only to indicate to my readers a method which has done me good service from the first, in order that any one who wishes to experiment with the same may do so if he deem it sufficiently worthy of trial.

My collodion is a compound of three collodions. No. 1 is made up of the undermentioned ingredients:—

Rectified ether...	...	70 grammes
Alcohol...	...	30 "
Gun-cotton...	...	1 gramme
Iodide of cadmium...	...	0.5 "
Iodide of ammonium...	...	0.5 "
Bromide of cadmium...	...	0.3 "

The above formula produces a liquid of thick consistence, and perfectly colourless.

No. 2 is thus compounded:—

Ether...	...	60 grammes
Alcohol...	...	40 "
Gun-cotton...	...	1 gramme
Iodide of cadmium...	...	0.5 "
Iodide of ammonium...	...	0.5 "
Iodide of potassium...	...	0.3 "
Bromide of cadmium...	...	0.2 "
Bromide of ammonium...	...	0.2 "

A small quantity of sublimed iodine is added sufficient to give a pale yellowish tint to this collodion, which is more strongly iodized and bromized than the former, and likewise more liquid, on account of the large proportion of alcohol which enters into its composition.

No. 3 collodion is thus made up:—

Ether...	...	55 grammes
Alcohol...	...	45 "
Gun-cotton...	...	1 gramme
Iodide of ammonium...	...	0.8 "
Iodide of cadmium...	...	0.3 "
Bromide of ammonium...	...	0.5 "

This last formula resembles that of M. Inglis, which is a very quick-acting material; it is indispensable for the production of children's portraits, so beautiful when they prove successful, so detestable when they are failures.

The mixture of these three collodions is made at the time of their employment, equal parts of each liquid being taken, excepting when working under certain conditions, as every photographer will understand. Thus, in very cold weather, a somewhat larger proportion of No. 1 is used, which contains one-third of alcohol to two-thirds of ether; in very hot weather I augment the proportion of No. 2, in which the large amount of alcohol prevents the too rapid evaporation of the ether; and finally, in dull and rainy weather, or when children are to be photographed, the proportion of No. 3 is increased by reason of its greater rapidity, and of the larger amount of bromine in its composition.

It is regarded by many as a foregone conclusion—without, indeed, the existence of any absolute proof—that bromide of silver is more sensitive to weaker rays of light than the iodide of the same metal. Everybody may have his own opinion on this subject, pending a positive solution of the problem; and we are inclined to believe that the sensitiveness is due solely to the presence of iodo-bromide of silver with an ammoniacal base, produced by means of a double decomposition. The third formula employed by itself presents all the characteristics—both advantages and disadvantages—displayed by preparations in which iodide of ammonium predominates. For the purpose of comparison in a practical manner, I prepared a collodion of the proportions above indicated, so as to participate equally in the three formulæ, but the liquid thus obtained yielded unsatis-

factory results, whereas a mixture of the three compounds prepared separately continued to work wonderfully.

The explanation of the fact I have mentioned reminds one of the elaborate scientific researches which have been made for the purpose of obtaining wider information in respect to the formation of the photographic image. The action of light upon iodide of silver, the existence of an invisible image upon the sensitive plate, the action of the reagents which render the picture visible, all these are problems not yet solved. Notwithstanding the ingenious theories put forward by such men as Monckhoven, Poitevin, Davanne, Vogel, Carey Lea, and others, the phenomena are still unexplained.

It is for this reason, on account of this black screen placed against the horizon of photography, and completely shutting out the view beyond, that no formula for a collodion can be recommended as practically and theoretically good. The mathematician, by calculating the details of his work, is able to obtain a very correct idea of the total, as the partial inaccuracies on one side or the other mutually destroy one another. The mixture of the three collodions is based upon this principle, and it gives, we repeat, the best results.

ON THE SENSITIVENESS OF PHOTOGRAPHIC PREPARATIONS.*

When the approach of autumn warns us that the fine weather and the long, bright days are coming to an end, and that we must prepare ourselves for the dull and feeble light of winter, it is a source of regret to those among us who do not possess an open, unconfined studio, that our present process of negative-taking necessitates so lengthened an exposure. It seems quite superfluous to make any remarks upon the great value of short exposures, and it, on a recent occasion, an English gentleman has stated that he prefers results obtained with long exposures to those taken with shorter periods, on account of the less astonished and less forced expression of countenance exhibited by such portraits, we can only regard such statement in the light of a joke, for, as a matter of course, as soon as an efficient, instantaneous process has been discovered, no extraordinary skill will then be requisite on the part of the operator to secure any desired facial expression. We believe that it is matter of importance, now that we are enabled, after some experience, to obtain pictures of any description we may wish, whether vigorous or soft, sharp or bold, to turn our attention to this subject, and to commence researches which shall have for their end the devising of a method for increasing the sensitiveness of our photographic preparations. Researches in this direction are the more desirable inasmuch as very recently great improvements have been made in photographic optics, and we are now in possession of lenses which, in regard to depth of focus, sharpness, &c., are something perfectly wonderful, although, unfortunately, a longer exposure is necessary by their employment.

One need not be a very great enthusiast in order to prophesy a warm and eager reception to a thoroughly practical, instantaneous process; every photographer who has essayed children's portraits will admit this. It would then be scarcely necessary for an artist to expose in his studio the usual notice, worded something like the following:—
"Cartes-de-visite, ten shillings per dozen. Children pay double."

When we remember that the long exposure which was necessary in the early days of photography was considerably shortened, first by the introduction of collodion, and afterwards by the employment of iron development, and that during the last ten years very little has been done, except in a slight degree (by more strongly iodising the collodion), to increase the sensitiveness of the negative, although the subject was one that photographers have continually hoped to improve, we must admit that our progress

* Photographisches Archiv.

has of late been very tardy; and we cannot but side with the optician, who, when he is asked by the photographer for a quicker-acting lens, replies, "My lens is a good one, it is your plates that should be more sensitive," thus referring to the chemist the solution of the all-important problem. Our present collodion process with bromo-iodide of silver and iron development is not so sensitive in its action as the bromide of silver collodion with alkaline development. By the employment of an iron developer a much shorter exposure is necessary than with a weak pyrogallie acid solution, and in the same ratio is gallic acid to pyrogallie acid. Can we not discover a substance, or even several substances, that are to sulphate of iron what that compound is to gallic acid? Or must we look for other silver compounds, or for some other totally different material? Bichromate of potash has in the printing process proved itself to be three times as sensitive as chloride of silver; is it impossible to find a salt which is three, or even ten, times as sensitive as iodide or bromide of silver?

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Society was held in Myddelton Hall, on the evening of Wednesday, November 4th, Mr. G. WHARTON SIMPSON in the chair.

The minutes of a previous meeting were read and approved, and the following gentlemen elected members of the Society: Messrs. Maltby, Leunig, F. Hunt, J. Marham, A. Short, G. Colling, Thomas Hawkin.

Mr. WOODBURY exhibited some fine examples of his relief printing process, consisting of 10 by 8 reproductions of paintings issued by Goupil and Co., which were much admired.

THE CHAIRMAN called attention to some fine enamels by Mr. Henderson, brought by Mr. Taylor. He remarked that the enamels of M. Lafon de Camarsac had always been regarded as types of perfection in photographic enamelling; but some of Mr. Henderson's came very little short indeed, if any, of the excellence of the Parisian photographer, and he thought it matter for congratulation that such first-class results were produced in this country in a branch of the art hitherto much neglected.

No paper having been provided, the meeting resolved itself into a conversation, in the course of which some amusement was excited by an extract from a daily paper, to which a member called attention, in which some curious statements were made on boiling and baking as tests for permanence in photographs.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE eighth annual meeting of the Edinburgh Photographic Society took place on the 4th November current.

The Council's Report, which is a very satisfactory one, states that twenty subjects have been brought before the Society during the year, including three of the popular meetings for which the Society is famed. The number of members added to the roll during the year has been thirty-five, which gives a present muster roll of 184, excluding thirteen who have died or left the Society from various causes. Six new members were balloted for and elected unanimously during the evening.

The following office bearers were appointed for the ensuing year:—

President.—Sheriff Hullah.

Vice-Presidents.—Messrs. George H. Slight, James G. Tunny.

Hon. Secretary.—Mr. William H. Davies.

Hon. Treasurer.—Mr. John Hurry

Curator.—Mr. John Peat.

Auditor.—Mr. A. J. Niven.

Assisted by a Council of twelve gentlemen as under:—James Blackadder, Mr. W. D. Clark, Mr. Hugh Rose, Mr. John Scott Maccrieff, Mr. Archd. Buras, Mr. Jas. Bryson, Mr. Jas. Ross, Mr. John McNan, Rev. D. T. K. Drummond, Mr. Norman Macbeth, Mr. J. D. Marwick, Mr. Richard G. Muir.

The business sketched out for the next session promises to be full of interest, and we shall take care to keep our readers apprised of the various meetings as they occur. One feature of great interest in this Society is its so-called popular evenings, at which, by the aid of a powerful oxyhydrogen lantern, the pictures of the members and others are exhibited to large audiences. The idea is worth the attention of some of the more energetic societies.

Correspondence.

A PHOTOGRAPHER'S RELIEF FUND.

SIR,—I am willing to subscribe a pound or two, or more, a year to such a fund as soon as a satisfactory committee be formed. But who are the proper persons to subscribe to and receive from such a fund? in short, who are photographers? In this town the profession is represented thus: Branch of a Loadou firm, painter and glazier, shoemaker, hairdresser, glover, milkman, lodginghouse keeper, legitimate photographer. So you see there are eight likeness shops in this town; but I cannot count more than three or four persons who ought to be designated photographers—one who has practised sixteen years, and two or three others who are employed as operators. Such as stationers, chemists, hairdressers, &c., who add to their business that of a photographer, certainly ought to be excluded.

My suggestion is simply this: Let one in every town who has been long known to some London house in the trade confer with his brother legitimate photographers in his neighbourhood, with a view to ascertaining their feelings on the subject, and communicate the result to yourself, for the purpose of its being laid before any gentlemen who might be willing to constitute a committee. Should you think my plan worth consideration, perhaps you will give this a place in your valuable Journal.

I have only to add that I would at once confer with the one or two working photographers in this town who I consider to be the only persons who ought to subscribe to, with a view of participating in, such a fund.—Yours obliged,

November 9th, 1868.

W. MATTHEWS.

[Our correspondent very aptly illustrates some of the practical difficulties which, as we have suggested, require consideration, and which render necessary an examination and a full discussion of the question in its practical bearings as a preliminary to organization. We shall have pleasure in giving publicity to practical suggestions.—Ed.]

SIR,—The matter of forming a Relief Fund or Provident Society has once more become a matter of consideration. As a provincial photographer I can only recapitulate what has been said. I shall have great pleasure in aiding or assisting in any good cause that tends to benefit my fellows of the profession. Be he artist, photographer, operator, assistant, or printer, all within our circle, or linked to our profession, should have our warmest sympathies. Why should we raise any objection, to exclude any connected with the art? I may say, nothing like the time present. We cannot commence too soon in any good cause, so let us at once give our names in to you, Mr. Editor, and make a commencement, and those desirous of forming such can then have a meeting called; and if we reside out of London, we can pen our thoughts and send them, and have a voice in the matter. I would suggest a provident society on the same principle as the Oddfellows; it would be more independent for its members. I would not object to a special fund for emergencies or particular cases; and I feel fully confident we could have a photographic bazaar, and enlist the ladies to assist us. I am sure, Mr. Editor, if we only commence, we shall succeed. However, let us try; let some of your generous readers suggest a subscription as entrance money or voluntary free gift; I am quite willing to chime in and say yea with the rest. Hoping that this time the matter will not be lost sight of, I ask all connected with photography who can afford it to come forward and tender their mite in such a cause, or send their names for membership; and, Mr. Editor, I feel fully confident you will be most happy to publish anything any subscriber would suggest for the future welfare and progress of a Photographer's Provident Society or Relief Fund.

Thanking you for past favours, and apologising for trespassing on your valuable pages, I remain, &c.,

LUX ET SALUS.

SIR,—Entirely coinciding with the suggestion of your able correspondent "Stereo," in reference to establishing a Photographer's Relief Fund, that it is desirable to have the opinions of some of the representative men in photography on the subject, especially as you have so kindly opened your columns for recording such opinions, and being myself deeply concerned in the welfare of such a fund, and believing all who are interested in our art progress need only be appealed to for furthering so desirable an object, I take the liberty to suggest that advertisements in the daily press should be inserted, requesting that all persons connected in any way with photography, and who are in favour of assisting in the establishment of a relief fund for the above object, should send in their names, through post, to a secretary *pro tem*. I should think there would be no difficulty in getting a gentleman who would kindly undertake so laudable a duty. Then, after a sufficient time, which of course would be mentioned, a public meeting should be called in London for the purpose of forming a provisional committee for the purpose of drawing up the necessary constitution of the society; which being done, another meeting should be convened, to pass such rules and regulations, if approved of; and then some well known gentleman or firm should be appointed as treasurer for all donations and subscriptions received.

The party desiring relief should be recommended by those residing in his immediate neighbourhood, and should have had his name inserted in the society, either as a subscriber or donor.

In the meantime, as funds would be required for the payment of advertisements, &c., all persons desiring to aid the good object should send a donation to some trustworthy person appointed, until such time as the first public meeting should be called, when collections might be made as a nucleus for the general fund.—I am, yours truly,

J. NORRIS.

5, Church Road, Norwood.

PORTRAITS ON APPROVAL.

SIR,—Mr. Downes made a very just complaint in his letter to you last week when he said that people come and occupy your time for an hour or two, as the ease may be, pay nothing, and request that proofs may be sent, and eventually do not or will not approve of anything, however good, that may be sent them. The plan I adopt to avoid this is that of many photographers; that is, to have a notice fixed in a conspicuous place, in unmistakable language and type, to the effect that "Visitors are requested to pay before leaving;" or, "Prepayment is the rule." This notice brings the servant girls up sharp, but the "missusess" often do not seem to see it. When this peculiar exhibition of amaurosis presents itself, it is the duty of the photographer to explain in a bland (that's the word) and gentlemanly manner that, &c., &c. I do not do this, although it is very proper, and probably profitable, but let them have it hot or cold, according to the diagnosis I form of the offending subject.

Let photographers respect themselves and their art more, and not permit any man or woman, whatever their social position may be, to impose upon them, and such troubles as Mr. Downes complains of will not be so frequent. The other day a great swell, in appearance and his own estimation, brought a lady to my studio to be taken. While she was taking off her bonnet in one room, he observed in the reception room a notice that prepayment was the rule; he demurred at this, said Mayall had recently taken his portrait, and he (Mayall) did not require it of him. The lady had to put on her bonnet again, and they were both politely bowed out by—Your obedient servant,

November 9th, 1868.

PAS-TROP.

ALBUMINIZED PAPER AND PRINTERS.

DEAR SIR,—It affords but a humiliating testimony to the much vaunted intelligence of the present age, when "one who holds decided opinions of his own" is regarded as a rare phenomenon, who is favoured with the "esteem" of none but the discerning few. And it is a subject for gloomy reflection that in the event of such opinions running contrary to popular

ideas, no small amount of moral courage, to overcome feelings of self-interest, must be called into requisition ere the newly-conceived thoughts may be exposed to the jealous scrutiny of the narrow-visioned multitude, who desire progress, but insist on the retention of old notions that have long been favoured because of their respectable origin. Those pseudo-progressionists, apparently oblivious of the fact that genuine progress is the offspring of original conceptions, would have the world stand still rather than allow their self-esteem to suffer the momentary pang inflicted by the advent of any opinion that strikes at the root of unsuspected ignorance. I readily concede that an idea might be strictly original, yet decidedly useless; but it must be admitted that thoughts, however valuable their import, remain comparatively worthless until such time as they can be introduced into their natural sphere of action. And if we accept the dictum that all who can do so, should add their mite to the general fund of knowledge, why, I enquire, should any boldness be needed to enable the donor to perform a duty which the world claims as just? Why should the performance of such duties create fears of probable displeasure and pecuniary losses? "But the world should be wooed into complacency with softly-moulded sentences," observes the well-drilled disciple of the polite Chesterfield school. "Call not a spade a spade, which jars on the ear, and sounds harsh and unseemly; rather name the implement a rural excavator, and you exhibit proofs of gentle breeding. By the same rule, if the world lack knowledge, hold thy peace, and you set a value on your future fortune." To those who consider self to be the alpha and omega, the doctrine thus laid down might prove profitable; but, speaking in my own behalf, nature never fashioned me to act the part of courtier. Having struggled through what little knowledge I possess in a stern matter-of-fact school, I am unable to robe my words in wool, or to dip my pen into the ink of flattery or of fulsome prevarication. I write what I believe to be the truth, and I never advance a statement which is not borne out by an abundance of argument ready to be "called to the front" if required. If I am wroth to "lose my head in wordy rhapsodies," my readers might depend on the fact that I never go beyond the proofs I have at command when I venture on personalities during the absence of my wits without leave.

Now, sir, with reference to remarks offered by Mr. Cherrill in your last issue, permit me to observe that my comments on that portion of his paper which treated on printing matters were not the results of an intermingling of Mr. Cherrill's observations with the discussion which followed; but any argument bearing on that point need not now be urged, as I find the inferences I drew from Mr. Cherrill's words are now recorded in plain language in that gentleman's reply to my last communication. Mr. Cherrill considers that photographers should know the amount of salt contained in the papers they employ. He deems it a duty to be observed by paper albuminizers that their customers should be told what kind of negatives they must produce, and the quantity of silver each quire of paper will consume; and, to bring his remarks home, he threateningly foreshadows a revolution which will extort from the albuminizer secrets he never valued—information he does not possess. I venture to predict that when such change occurs, it will soon be found that the change has changed nothing. Speaking for myself, I would gladly adopt the hints thrown out by Mr. Cherrill at once, but I am bound to confess myself ignorant of knowledge I fain would impart; I therefore ask of that gentleman, as a man of science, distinct replies to the following queries:—

1st. The amount and description of chlorides added to each ounce of albumen being known, by what means can the quantity of albumen absorbed by each sheet of paper be ascertained? In his calculations I would have Mr. Cherrill bear the fact in mind, that an average summary would not accurately solve the problem, as papers differ in texture, and, consequently, in powers of absorption; and albumen may be said to change strength after the floating of each sheet thereon.

2nd. Supposing the amount of salt each sheet contains could be ascertained by an impracticable process of weighing before and after its being albuminized, what amount of silver must the albumen be credited with?

3rd. In what manner is the silver bath to be constructed, that in order to prevent a loss of uniformity a uniform adjustment of free nitrate may be provided for throughout?

I think I might, without egotism, pronounce my practice, as

described in a recent article on sensitizing baths, more practical and infinitely less troublesome than any scheme that may be extracted from the above series of problems.

Again, Mr. Cherrill asks uniform working qualities in the papers supplied him, and he cites, as an instance of the uncertainties that attend the papers he has in stock, his experience with articles supplied him by myself. I heartily thank him for information which bears so forcibly on the argument I adopt. I declare, on my honour, that both papers described, Saxe and Rives, were coated with a similar quality of albumen, and in both instances the same salting formula was adopted; yet results differ widely. Why? In the one case (the Saxe paper) the albumen rests on the outer surface; in the other (the Rives) the albumen was absorbed by the paper, and a surface more readily penetrated by the silver solution results; hence the Saxe paper yields an image of lesser vigour than can be secured with the Rives sample.

The "Salomon negative" is doubtless a repeat of Salomon's grand style; ranging in harmonious gradation from comparative opacity to clear glass. To secure the best results from such a negative a paper moderately salted is needed, and the printing should be executed in a bright but diffused light. "Now," observes Mr. Cherrill, in substance, "if we could depend on a uniform supply of a similar kind of paper, we could adopt this Salomon negative as a standard of intensity, and produce all our negatives in unison." Query. Could such a plan be made practical? If so, would such treatment be at all times judicious? How about the negative of that imaginary scene "where the sun shines low over a calm summer sea, and the only faint shadows are obtained from the darker sides of the tiny ripples"? Observe the two extremes: one all vigour and full of contrast; the other a combination of flatness with weak effect. Would a uniform paper with the most uniform treatment suit both subjects? Unquestionably not, except the paper was aided with judicious treatment and the requisite modification of chemical solutions. Fact of the matter is just this: it is not a uniform paper really needed, neither is it any information concerning salting formulae that will remove the plague of bad pictures; what is really requisite is, an honest recognition of the comparative ignorance that prevails in connection with the printing department. As I have observed elsewhere, the art of printing in silver is held in too low an estimation. The work is entrusted to boys, or to no less incompetent men; and as long as unskilled labour is employed in the production of silver prints—as long as the employers remain blind to their own imperfect knowledge of a subject which requires a very large amount of experience to master—so long will demands be made on the paper albuminizers, who are unfairly set down as the authors of every ill their productions meet with.

In conclusion, I would just state that it involves a heavy tax on my time to prolong this discussion; but as long as useful matter can be elicited from the remarks of those who may desire to discuss the question with me, I am open to all comers. I remain, yours respectfully,

W. T. BOVEY.

Willesden, November 10, 1863.

MR. FRY'S MODE OF MASKING.

DEAR SIR,—I am much pleased with the prospect of great improvement in the printing quality of negatives likely to be realized by Mr. Fry's new and improved method of masking. Individually I beg to offer him my grateful thanks for his liberality in making it public. I desire now to take advantage of his kind offer, in last week's issue of *THE PHOTOGRAPHIC NEWS*, of giving all further information to anyone requiring it; and, before doing so, I feel that an apology is due to him for my troubling him for information which to professionals would, probably, appear quite simple and plain; and I have only to plead as my excuse that of my being an amateur in the art, and consequently, not learned in matters photographic, although I must confess to being of very many years standing.

1. I would enquire of Mr. Fry how I am to make the necessary transparency—whether by superposition on a dry plate, or any other way? And if by the first-named plan, what process would be the most simple and effective?

2. As the transparency would be on the same sized plate as the negative from which it was printed (with myself it would be a quarter-size one), how am I to get the transparency into immediate contact with the back of the negative, seeing that

it—i.e., the transparency—would be kept at a considerable distance from the negative by the front projecting part or rim of the usual little quarter-plate printing frame? This is my present greatest difficulty.

If it be not trespassing too much on Mr. Fry's very great kindness, I should feel myself under an additional obligation to him if he would oblige me with a carte size specimen of his new method of double printing, for which I would with pleasure remit him his usual charge on his naming the necessary sum. May I venture to add that it must be carte size only, as I keep an album especially devoted to photographic novelties?

Would Surbiton be a sufficiently intelligible address to reach Mr. Fry?—I am, dear sir, yours sincerely, HENRY H. HELE.

High Cottage, Teignmouth, Devonshire, November 10, 1863.

Addendum.—Under my second query to Mr. Fry I might have said that it would not be practicable to remove the negatives with the partly printed impressions from the printing-frame, in order to insert the transparencies in front of them, as it would be impossible to replace the three in their exact and proper places by such a procedure.

H. H. H.

[Mr. Fry will, perhaps, kindly answer our correspondent, and so impart the information required to others besides.—ED.]

PHOTOGRAPHY AND PERSPECTIVE.

DEAR SIR,—The subject started by Mr. Anthony is a most interesting one, and although I believe him in error as regards the proportional increase in the reflection of the extended hand in the mirror, I think he has done good service in raising the discussion upon the relative pictorial truth of lenses of various length of focus. From my own experience I have reason to believe that those that will show upon the ground-glass an angle of view equal to one-seventh part of a circle will delineate objects in true perspective, provided that they are in other respects properly constructed; beyond this the lateral rays become too oblique, producing angles which natural vision could never see, and bring the points of distance almost into the picture. The so-called panoramic lenses have this objection, and are, as far as the production of pictures in natural perspective goes, a delusion. Panoramic pictures are not thus designed, but in sections, some objects being introduced and so arranged as to hide the beginning and ending of each section. Short-focussed lenses are, undoubtedly, of service in many cases, but they dwarf the objects in the picture. Lenses of too long a focus, on the contrary, make them appear too high; this is caused by the former producing the lateral rays longer and the latter shorter than those in natural vision; thus in both cases the eye refuses to recognize truth in their delineation. Place a camera having a wide-angled lens in front of and about the middle of a long brick wall, for an angle of 25° on each side of the central visual ray, the courses of bricks will appear straight on the ground-glass, but from those points they will appear gradually to converge on each side to the points of distance. Again, make the front elevation of a portico supported by pillars the subject, and in this case the pillars nearest the sides will appear larger than those in the centre, proving that with such lenses perspective truth is out of the question.

In portraiture the same theory holds good. I do not think exaggeration in foreshortening will be produced by lenses of proper focus unless brought too near the sitter, or what is termed strained, in the attempt to obtain the representation of a head of a larger size than the lens is intended to produce. As regards reflections of objects as seen in a looking-glass, the angle of incidence will always be found equal to the angle of reflection, and therefore the reflected object will always appear as far behind as it is before the mirror, and the foreshortened hand will advance its reflection accordingly. It is probable that the demand for short-focussed lenses has been caused, in many cases, from the very limited space often only to be obtained wherein to erect a studio, or from a wish to avoid the increased expense in the building of a larger one, without giving a thought—or, perhaps, having a knowledge—of their peculiar qualities; in out-door practice, from the desire to get as near to the object as possible, or to obtain more subject-matter in the pictures. But these should all be exceptions, and not the rule, and their use restricted to such cases accordingly. The reader may form a good idea of the effects of angular distortion by experimenting with a toy called the Dubosqueoscope. It consists of a semi-circular mirror, which stands on the table, and a set

of diagrams, which, when looked at in the usual way, appear a confused network of distorted lines, but when properly placed before the mirror they resolve themselves into various objects in proper perspective.

JAMES MARTIN.

114, High Street, Ilfracombe.

Talk in the Studio.

EMBEZZLEMENT BY A "DOORSMAN."—Benjamin Carmichael was charged at Guildhall Police Court with embezzling 25s. belonging to his employer. It appeared that Mr. Nippres, a photographer, carrying on business at 87, Farringdon Street, employed the prisoner as what was termed in the trade a "door man;" that was, a man to stand at the door and solicit the public to have their portraits taken. He was to receive for his services 1s. 6d. per day and 2d. per customer commission. He was put to work on Friday last, and, after being on for a little time, the prosecutor sent him to pawn a lens for 30s. which was worth £1. The prisoner, after trying various pawnbrokers, and not being able to get the required amount, took it to Mr. Wood, in Shoreditch, who lent him 25s. on it. The prisoner then sold the ticket, and the lens was taken out of pledge next morning. The prisoner never returned to his employment, and never paid over the 25s. he received for the lens he pledged, nor the money for which he sold the ticket.—The Prisoner, in defence, said that he was not to have wages at the rate of 1s. 6d. per day, but was to be paid 25 per cent. on the customers. He also said that he lost the money, and that was the reason he did not go back to Mr. Nippres, but if time were given him he would repay the money.—After considerable discussion, the prisoner abandoned his line of defence, and pleaded guilty to embezzling the money, so that he might be dealt with under the Criminal Justices Act.—He was sentenced to three months' imprisonment, with hard labour.—*Standard.*

CHEAP COLLODION FILTER.—A correspondent of the *Philadelphia Photographer* gives the following:—"Being without a collodion filter, and being economically disposed, I thought I would try and make one out of home material, and succeeded in making one that answers the purpose admirably. Here is the way: Take a half-pound cyanide bottle, with a wide mouth, and good cork to fit; get another one of similar capacity, but with a small neck, which (the neck) ought to be full an inch or more long. Turn this bottle upside down in something to make it stand, and right at the foot of the bottle tie around some wick saturated in alcohol; set it on fire, and when burnt out immerse quickly in cold water, which will cause it to break off around the foot in a complete circle. Take off the lip from the neck in the same manner. By cutting smoothly a hole of the right size in the cork of bottle No. 1 you can fit the neck of bottle No. 2 into it, which should be put in with shellac. Then get a small glass tube, about five inches long, and with the aid of the pincers slant off one of the ends a little; wrap some clean cotton round it, about an inch from the point. This is put into the neck of the bottle to fit tolerably loose. The end of the tube must reach about an inch from the top, so as to leave space between it and the large cork, which is now to be fitted nicely in the broken end, and the thing is as complete as any poor picture-taker need have."

CURIOUS EFFECT OF GELATINE UPON GLASS.—A correspondent of the *Philadelphia Photographer*, noticing a paragraph which appeared in our pages a few months ago, describing the exfoliation of glass by the contraction of gelatine on its surface, says:—"In the course of an examination of old English and French periodicals and Transactions of Philosophical Societies, we met a very similar instance to the above, in the *Histoire de l'Académie*, 1708, page 22:—'*Exfoliated Glass.*'—A person having applied on a piece of glass, about six inches square, a paste of Spanish white and glue size, placed the whole in the sun during the great heat of summer. The paste, which was turned towards the sun, having been much heated, rolled itself up, so that in this movement its under side was raised upwards. But, what was more singular, this surface raised with it and carried away a layer of the glass. This layer made on the paste a species of varnish, as of porcelain, the thickness not exceeding one-half a line. It was astonishing that the adherence of the paste on the glass was so strong, and equally so that it should be able to detach from the glass so considerable a sheet. It had been blown, and apparently they had re-

plunged the pipe with which it was blown in the crucible at different times, which had given it several layers, which, however, were not apparent, because they were exactly applied one upon another. It is to Geoffroy that we owe this observation." We were always a little incredulous about this statement until we saw the above item from the *Photographic News*."

DOES WATER EXPAND ON BECOMING ICE?—When a bottle of water is frozen, the bottle is usually burst. Hitherto this has been explained by the assertion that the water on solidifying suddenly expands. M. Barthélemy, one of the professors in the Lyceum of Pau, denies this explanation. In a memoir which he has written on the crystallization of water, he alleges that bursting of the bottle is caused by the disengagement of a large quantity of gas—hitherto in solution—by the water at the moment of its solidification. It is alleged, in support of this, that if a bottle of water be placed outside a window in frosty weather, it will be observed that the rupture takes place at the hottest side, viz., that next the window. Some of our correspondents must have made experiments on this point, and we shall be glad to hear what they have got to say to M. Barthélemy's opinion.—*Scientific Opinion.*

THE FUNGUS THEORY OF DISEASE.—In a short communication to the *Centralblatt*, Drs. Bergmann and Schmiedeburg describe a crystalline substance, to which they have applied the name "sulphate of sepsin," obtained from putrefying materials, and which they believe represents the proper poison of organic substances undergoing this kind of fermentation. It is obtained, says the *Lancet*, by diffusion through parchment paper, precipitation with corrosive sublimate from an alkaline solution, removal of the mercury by silver, of silver by sulphurated hydrogen, evaporation, and purification of the residue. Large, well-defined, acicular needles are thus obtained, which are deliquescent in the air, and, exposed to heat, melt and carbonise. They possess a powerfully poisonous action. A solution containing scarcely more than one-hundredth of a gramme was injected into the veins of two dogs. Vomiting was immediately induced, and after a short time diarrhoea, which in the course of an hour became bloody. After nine hours the animals were killed, and on examination their stomachs and large intestines were found ecchymosed, and the small intestine congested. Frogs could be killed in the same manner.

THE "CENSOR" ON POPULAR PORTRAITS.—The *Censor*, an able journal of satire, which we have before quoted, has the following remarks on one of the uses of photography:—"There is a simple, somewhat pretty face to be found in the photographic shops—those indecent store-houses of Holywell Street pictures of women with bare legs, arms, breasts, bare faces—bare of any meaning but impudence, and even that of a bad quality—of gaunt, angular forms, worn and vicious looks—of patent wrinkles, paste, false hair, and real folly. And this pretty face looks innocent, with a serpentine innocence—beside the raddled and too-known actress and hetera of the day. It has a grain more intelligence than the faces of the Royal Family, side by side of which (such is popularity) it stands; and it owns a prettier name than Albert Ernest Edward, or Albertina, or Alberta. 'This simple, short, and dainties with the tenderness of love like—'itself, 'Mabel May.' And who is Mabel May? Simply the most fashionable and most followed *Lady* of the day. She is to be seen in certain dancing-saloons, wears fifty-guinea dresses, and makes £5,000 a year by her art—not heart. Should she be as lucky as Mrs. Wyndham, some rich fool may marry her. What is most curious is, that photographers are anxious for her portrait, and hundreds of young ladies buy it for their albums. 'It is so simple,' says the grinning shopman. Simple, indeed! Imagine a brother or a future husband looking over 'one's few friends,' and finding therein 'the common spouse of half the town,' as Doctor Armstrong says. The French would make a drama of such an incident."

A GOOD CEMENT.—The *Scientific American* says:—"The best cement we know of for general use is made as follows:—Isinglass, 2 drachms; soak 24 hours in 2 ounces of pure water; boil it down half, add 1 ounce of rectified spirit, and while it is hot strain through linen. Next melt one drachm of mastic and ½ drachm of gum ammoniac in 1 ounce of rectified spirit; add the latter solution to the first, and mix thoroughly. This may be used for joining almost anything that is broken, but is too expensive to be used as a substitute for glue where the latter will do as well. In cementing, warm the edges of the articles to be joined, and spread the cement over as thinly as will cover the entire surface. Most people use too much."

To Correspondents.

T. G.—An Eburneum print is practically a transparency on opaline gelatine. It is obtained by camera printing on wet collodion. 2. In printing stereoscopic slides in the camera on wet collodion no transposition in either negative or print is necessary. The operation of camera copying practically turns round each picture on its axis, and effects a similar result to transposition. Of this you can easily satisfy yourself by experiment. The lenses you mention will do very well, we have no doubt. 3. In the case you put there is a choice of two evils: at one end of the room the evening sun will trouble the sitter a little, and at the other it would enter the lens. We should be disposed to decide the question by experiment, trying whether you could more easily keep it by blinds from the sitter or the lens. 4. Hydrochloric acid alone is sufficient to precipitate silver as a chloride from washing waters; but salt alone is not always safe. 5. We believe that the period for protection by registration is expired.

C. M. writes:—"I am a chemist and druggist, and having carefully studied the new Pharmacy Act, have not a doubt that you are right in stating that its provisions do not come into operation until after the 31st of December, after which, as the first clause states, 'it shall be unlawful' to neglect the precautions afterwards indicated. The uncertainty felt by some seems to have originated in an error made by a London magistrate, who fancied that the provisions of the Act came into immediate operation, and, when the error was pointed out, justified his position by referring to a clause in the Act without a date. As the matter stands, it was at best but an opinion even regarding this clause, which is clearly governed by the preceding one giving the date. If a decision had been given on the assumption that the Act was in operation, we should have heard more about it." The subject is scarcely worth reiterated discussion, as very few, we imagine, dealing in poisons would fail to obtain the Act, from which they would gain full information. The question does not appear to us to admit of a doubt by any person not having a position to maintain. The 17th Clause, defining some of the conditions under which poisons may be sold, is clearly, as you suggest, together with all other clauses, governed by the 15th Clause, which states that "from and after the 31st day of December, 1868, any person who shall fail to conform with any regulation as to the keeping or selling poisons made in pursuance of this Act," &c., shall be liable to a penalty of five pounds. This is the only penal clause regarding the sale of poisons which the Act contains, and is therefore the clause which defines punishment. The *Standard* points out that Mr. Flower cannot have read the Act very carefully, as he made a mistake in referring to "red precipitate" as a poison included in Schedule A in the Act, whereas it is not mentioned at all. 2. Hyposulphite of ammonia in crystals has not yet become an article of commerce. Mr. Losh is manufacturing it in solution, but we believe that the difficulties in crystallizing it on a large scale have been found insuperable.

ARCHER CLARKE.—The date, as well as the name, is an essential item in the publication line of an engraving. The copyright in engravings remains in existence for twenty-eight years from the date of first publication, which should be distinctly stated on the print. We shall examine your specimens, preserved by Mr. Robinson's syrup, with interest.

ANXIOUS.—The coarseness of your copy of a card picture, reproduced the same size as original, is not due to the kind of lens used, but to other causes. When you copy an albuminized print you get in your negative not merely an image of the picture, but of every little inequality in its surface, and light being reflected from a thousand such inequalities will give you a coarse, mealy, flat, imperfectly-defined picture. To get a good copy from an albuminized print is always difficult, and this difficulty is increased when you copy the full size. You may, however, use several adjuncts to success. Roll the print well, so as to secure the smoothest possible surface, and take care that it is illuminated with light equally falling upon it from all directions, so that its inequalities may not give cast shadows. Some approve of wetting the print and attaching it to the surface of a piece of plate glass, so as to get as perfect a surface as possible. Your rectilinear lens will answer better for the purpose of copying than your stereo lens. There is no absolute rule for distance between subject and lens. Judgment must be used in relation to the special circumstances. 2. The white precipitate which you say is deposited is doubtless chloride of silver. Such a result should not take place. What sample are you employing? Collodio-chloride pictures on opal glass are best toned before fixing; developed prints on iodized collodion after fixing. 3. The application of glycerine to a prepared wet plate as a preservative does not answer, and will generally produce fog. If glycerine be employed as a preservative it should be prepared as described in our pages by Mr. Blanchard some years ago. In all such preservative processes there is considerable loss of sensitiveness, and some uncertainty of

result. Our correspondents need not apologize or feel hesitation in presenting their difficulties; we have pleasure in answering them to the utmost of our power.

C. T. U.—To become a member of any of the London societies it is necessary to be proposed at one of the monthly meetings, and balloted for. We shall have pleasure in proposing you.

J. E. W.—The removal of prints mounted with starch is not easy, especially when they are in an album which does not admit of soaking; but the simplest and neatest plan is to cut pieces of thick blotting-paper rather larger than the size of the print, and, after saturating with water, lay upon the face of the print. After soaking in this way, continued for some time, the prints may be gently removed.

J. B. M.—It is a difficult thing to give a precise proportion of silver or silver solution to be added to the printing bath, because different samples of paper, having different proportions of salt, reduce the strength of the bath in different degrees. Observation only can afford safe guidance in this respect. As a rule, the replenishing bath should be stronger than the bath in use, because silver is removed in greater proportion than either nitrate of soda or sugar, the latter substances being removed in their due proportion to water, and no more. 2. We have not had any experience in copying horizontal tombstones, but should conceive that a lens which gives straight lines will be necessary. If you could secure sunlight, in the morning or evening, so as to get incised letters in shadow, we should imagine the best result would be obtained.

THOMAS STOTHARD.—In asking for some information on mounting you do not state the nature of the information you require; whether it relates to the adhesive materials to be employed, or the mode of using them, or to the mounts, margins, &c. The adhesive materials have been discussed in our pages within the last year or two, and other points in former volumes. If you will state on what points in regard to mounting you desire information we shall have pleasure in assisting you. 2. Sulphate of copper is not a restraining, but a reducing agent; used in the developers, it modifies the action of the iron salt, but its precise operation has not received much attention. 3. Combination printing has been fully described in our pages, and probably will be again. You will find a copious article on the subject in our *YEAR-BOOK* for 1864. It is too comprehensive a subject for treatment in this column.

SUBSCRIBER FROM THE FIRST.—We do not know of any powder which could be applied to the lower lip to make it come out darker in the photograph; nor is it probable that if we did, your sitters would willingly adopt its use. On the stage, ladies occasionally use a red salve to colour the lips, which often gives an unnatural effect, and is said to be injurious to health. One cause of lips coming out light is the practice common amongst sitters, especially when they are nervous, of moistening the lip just before exposure. This they should be cautioned against. A touch of colour in finishing the picture will generally reduce the excessive effect of prominence.

W. E.—The cards were delayed a few days, but had been posted before your letter was received.

W. J. A. G.—An experienced dry-plate man may succeed in getting good results in a dull light; but the chances are against success, and, except under necessity, it is not wise to run the risk. The peculiar markings of which you send us an illustration appear like the result of blisters; but they may have been the result of some defect in the preparation of the plate. The print sent is apparently one from a subject not very well lighted: slower development and a little more bromide would probably have been useful. If you send a negative we may possibly help you more effectually. 2. Thanks: we will record your promise. True: tho "stuff" to which you refer is neither worth reading nor notice. You should, if possible, get to the exhibition in Conduit Street. We have no doubt that examples of many of the pictures exhibited may be purchased.

H. C.—Thanks; we shall have pleasure in receiving your proposed notes of your landscape experiences.

C. H. FREE writes to express his approval of a Relief Fund, and urges imitation of the course of "Gum Gallic Amateur." Thanks.

S. B. BARNARD.—Thanks for your interesting letter and admirable cabinets, which are excellent in photography, as well as interesting in subject. The portrait of "Oliver Cromwell" affords a singular illustration of the persistence of types, and are full of interest. Your suggestion for a mixed album for cards and cabinets is a good one, and we will try to give it effect in the right quarters. We quite agree with your views on the question of touching, both as to its scope and legitimacy. We shall refer to your letter again.

H. H. H.—Herr Grasshoff's work on Colouring is only published in German: the publisher is Louis Gerschell, Berlin.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII. No. 533.—November 20, 1868.

CONTENTS.

	PAGE
The Photographic Society's Exhibition	553
Chemical Action of Light.....	554
Does Water Expand on Freezing?.....	554
Visits to Noteworthy Studios	555
On a New Series of Chemical Reactions Produced by Light. By John Tyndall, LL.D. F.R.S., etc.	555
On Producing Open-air Effects in the Studio. By Charles E. Pearce	556
Pictorial Effect in Photography. By H. P. Robinson.....	558

	PAGE
Proceedings of Societies—South London Photographic Society—Amateur Photographic Association	559
Correspondence—Lux Graphics on the Wing—Albuminized Paper and Printers—The Late Solar Eclipse—Photographer's Relief Fund—Printing Formulae—Portraits on Approval	560
Talk in the Studio	563
To Correspondents.....	563
Photographs Registered	564

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

A second visit to the Exhibition of Photographs in the Society's rooms in Conduit Street confirms the favourable impression we first received, and we feel an additional satisfaction we had scarcely anticipated in noting the order, symmetry, and general good effect of the hanging, a result which at six o'clock on the evening of exhibition we had not believed possible, seeing that important contributions had not at that hour ceased to arrive. By the hearty and judicious labours, however, of the hanging committee and volunteer friends, the pictures were all hung before the public arrived, and no good pictures got really bad places.

Another fact struck our attention, which is worth noting, namely, that the mode of mounting and framing, as well as the style of portraiture, of M. Salomon had produced a revolution in the practice of portraitists. Instead of the universal white mount with a margin of a few inches wide, we have now many pictures framed close up, some with gold frames, some with gold and black. In many cases this is an improvement; but it chiefly interested us because it indicated a disposition on the part of photographers to get out of the groove in this respect, and exercise individual taste, which we regard as a healthy symptom. Indeed, we regard the tendency to what may, in some degree, be regarded as imitation of M. Salomon as satisfactory, not simply for the unquestionably fine results already presented, but for the promise they give of further excellence in probably various styles, when the influence of suggestion has passed, and equally fine pictures, with more distinctive individualism, shall be produced.

It is not our intention to enter into minute or detailed criticism of the pictures displayed, as the short duration of the Exhibition renders such notice comparatively useless. When an exhibition is open for a prolonged period, and the pictures can be examined after a criticism has been read, comment and observation may often be suggestive and instructive; but as the Exhibition will be closed before these remarks can reach the reader, but little lesson could be conveyed by extended notice. In reference to the portraits by M. Salomon, which constituted a chief feature of attraction, we may remark that they scarcely did him as much justice as those in a former exhibition. Those we sent last year from our own examples of his work were a fair but selected average; those sent this year were, with one or two exceptions, a number of old specimens, sent off at the last moment because they chanced to be ready. But, with these drawbacks, they arrested general attention, and won universal admiration.

Of the dozen persons who exhibited portraits in the same style, all succeeded more or less, and in much higher degree than might have been anticipated. Perhaps most completely approximating to those of the master of this especial school are the contributions of Mr. Blanchard, who contributes a

dozen exceedingly good examples, full of force, delicacy, and modelling, and having fine chiaroscuro. Messrs. Robinson and Cherrill only exhibit two portraits: one of M. Salomon, and one of Mr. Hain Friswell, a well-known *littérateur*. The latter we have heard pronounced the finest portrait in the room; it is singularly solid and well-modelled, delicate and rich, and the expression is rarely life-like and satisfactory. Mr. Netterville Briggs stands very high indeed: his pictures are a little larger than the mass of examples of this style, and in excellence leave little to be desired. Mr. Mayland, of Cambridge, contributes half-a-dozen examples of this style, all fine; but one of which—a gentleman engaged in painting—is of surpassing excellence. Mr. Slingsby, of Lincoln, has some very capital examples, both in single figures and groups; a lady in a black velvet dress being singularly luminous, as well as rich in effect. Mr. Burgess, whose eburneum pictures are well known, exhibits portraits based on the style to which we have been referring, but with distinct characteristics, one large head of himself resembling a reproduction from an old master. His standing portrait of Mr. F. Sutton, of Norwich, was very excellent. Of the especial qualities of the examples by Mr. Fry we have before spoken; but we may again refer to the portrait of an elderly gentleman as especially good, tranquil in feeling, and round and rich in effect. Messrs. Fradelle and Leach exhibited whole-plates in the same style. These are not framed close up, but have buff mounts, which are not ineffective; many of the pictures are very fine in taste and execution. Mr. Leake has a fine frame close by those just mentioned, which are exceedingly effective, but somewhat more worked upon than the majority of the Salomonian pictures here exhibited, which, for the most part, exhibited very little touching indeed, some of the best being quite untouched. Some similar portraits by Mr. Dunmore possess very good qualities, and are very effective. Mr. Ashdown has some examples in the same style. Mr. Gillo, who contributes largely, has some very spirited pictures, in some respects resembling the style under notice.

Some fine examples of other forms of portraiture are exhibited. Mr. H. C. Heath, amongst other good examples, sends some especially fine portraits of babies, charmingly arranged, happy in expression, and fine in execution. A frame by Messrs. Lucas and Box displays fine taste and skilful execution. A group of three children with natural background, by Messrs. Robinson and Cherrill, is admirable in grouping; the background is an admirable landscape, and the picture most effective. Mr. Duncan Cooke exhibited some good portraits. Mr. Henry Herring's vignettes are very delicate and round. Mr. R. Gillo exhibited some very pretty and artistic cards, and some good cabinets, amongst which were examples of transferred collodion prints. Some very fine cards and cabinets, displaying much taste, were exhibited by Mr. Godbold. Mr. Hewitt's cards and whole-

plate pictures were good. Mr. Bowen's portraits were spoiled by a noisy mount. The cabinets with natural backgrounds, by Mr. N. Briggs, were exceedingly perfect. A variety of styles of portraiture, all displaying very fine taste, were exhibited by Dr. Wallich. Mr. Downe's portraits were delicate, forcible, and well arranged. Mr. B. J. Edwards exhibited some portraits possessing excellent qualities in a rare degree; they were singularly fine in texture, solid, well modelled, delicate, and artistic in feeling. Mr. Bateman, of Canterbury, has some very admirable vignettes, at once delicate and forcible. Mr. J. H. Redin, the Governor of Carlisle Gaol, has a frame of capital portraits fixed with hyposulphite of ammonia; nothing could be finer than the tone and quality; time alone will, of course, be the true test of the superior value of the fixing agent. Messrs. Bullock Brothers also exhibited some good portraits. In the absence of a catalogue it is easy to neglect the mention of some meritorious pictures, but we have mentioned the chief examples of plain portraiture which came under our attention.

The pictorial compositions and art studies in this exhibition are, for the most part, of unusual excellence. Occupying a place of honour, Mr. Robinson's "Returning Home" formed a constant centre of interest to visitors. We have before fully described this picture, and need not enter into further criticism. Mr. Rejlander has a splendid collection, both on the walls and in a portfolio. Few artists, either in photography or painting, have ever exceeded him in giving expression to a thought in the treatment of a single figure, and here are dozens of examples illustrating that photography is wonderfully plastic in the hands of a true artist. Perhaps nothing in the exhibition exceeds in beauty and artistic feeling a little study by Mr. Hubbard, representing a young girl looking out of the window upon a street scene, admirably made out, yet perfectly atmospheric. It is a small picture, about five inches by four inches, and is obtained by double printing, the result being charming. Some other artistic pictures of the same size are exhibited by Mr. Hubbard, and a twelve by ten study, which is full of cleverness. It represents the interior of a cottage with large, old-fashioned fire-place, and various articles of furniture spread around. An old woman sits peeling potatoes, and forms the centre of interest in the picture. The perfect harmony and keeping of the picture, the quietness with which every accessory keeps its place, the admirable blending of the real objects with the painted background, all form a most effective picture, which half the visitors pronounced unhesitatingly a copy of a painting. Mrs. Cameron sent some good examples of her peculiar style, amongst which were some fine examples of artistic feeling, with less slovenliness of execution than we have before pointed out. Mr. C. Twyman's picture, "Be asy, now!" is another of the examples of the plastic power of photography in which this exhibition abounds, and is one of the cleverest pictures in the exhibition. Mr. Crawshaw sends several studies, in which the photography is very excellent indeed: we prefer "What can he be doing?" as a picture. Mr. Brewer's "life studies" are fine vigorous heads with fine expression. Mr. H. R. Rump had some fine large character portraits, which were very effective. Mr. E. W. Dallas, whose name used to be familiar to photographers a dozen years ago, sent a single study, entitled "Samuel," which had many fine qualities. Amongst portrait studies, a fine rugged head, entitled "On the look out," by Mr. Ashdown, may be mentioned. Belonging to this branch of photography, also, may be mentioned some pretty cattle studies by Mr. Archer Clarke, some horseback pictures by Mr. Avey, and some small pictures of animals by Mr. Jewell, and some others, all very excellent.

We had hoped to complete our brief notice of the exhibition, which must possess the character more of a chronicle of facts, than a criticism, this week; but we find that specialities, processes, coloured pictures, and apparatus must be deferred until our next.

CHEMICAL ACTION OF LIGHT.

WE print on another page an account of a series of exceedingly interesting experiments on the Chemical Action of Light, presented by Professor Tyndall to the Royal Society. To men of no profession can research of this kind present so much interest as to photographers. Upon the chemical action of light is based every possibility in their pursuit; and although its practical operation in their art is at present limited within a comparatively narrow range, and has reference to a small number of substances only, yet every step which widens the field of research, and every discovery which extends the domain of knowledge in this especial direction, are of value to the photographer, if not in presenting materials for immediate application, at least for enlarging the possibilities of his art.

The interesting researches of Professor Tyndall as to the action of light on certain vapours and liquids may have no immediate effect upon the practice of photography, but it is impossible to say at what point in his discoveries a practical application may become obvious. Let us illustrate by a speculation upon the possibilities attending his recent discoveries. In his paper before the Royal Society he states that actinic light decomposes the vapour of nitrite and nitrate of amyl. Amyl is a radical analogous to ethyl and methyl, the hydrated oxide of amyl being known as fusel oil, as the hydrated oxide of ethyl is known as ethylic, or common alcohol, and the hydrated oxide of methyl is known as methylic alcohol. Fusel oil is known to be a common impurity in ordinary alcohol, and its presence in collodion has long been regarded as injurious, and conducive to fog, without any knowledge of the reason why it should produce mischief. Prof. Tyndall's experiments suggest a series of possibilities. When fusel oil is in collodion, and comes into contact with nitric acid, either free in the bath or liberated by action of free iodine in the collodion, a trace of nitrate of amyl may be formed, and this body, being present in the film when exposed to the action of light, and possibly decomposed, would, under some circumstances, yield, as a product of decomposition, valerianic acid, a substance answering to acetic acid, as the product of the oxidation of common alcohol, or formic acid in methylic alcohol. Or, possibly, in the decomposition, intermediate bodies analogous to acetone or aldehyde, might be formed, with a well-known tendency to produce fog when present in a collodion film. Such a series of possibilities exist, and might furnish a clue to the fogging action of fusel oil when present in collodion, which, arguing from ordinary analogies, ought not to be more inimical to success than the ordinary alcohol employed in the manufacture of collodion.

DOES WATER EXPAND ON FREEZING?

WE gave in our last an extract from *Scientific Opinion*, in which M. Barthelemy denied the commonly-received opinion that water expands on freezing. The subject, although not strictly photographic, is one which will interest our readers sufficiently to justify a few more words on the question, which tend to negative the statement of the French savant. We append a letter from one of our readers who is a most shrewd and intelligent observer, in which he describes a fact which could not be accounted for on M. Barthelemy's theory. Our correspondent says:—

"A short extract in your last impression on the above subject calls to my mind a curious circumstance that came under my notice two winters ago. My operator, at night, filled a stoppered bottle with water, and in the morning the stopper was driven out, and projecting from the mouth of the bottle was a rod of ice about two inches long, perfectly smooth and transparent; the whole contents of the bottle was solid ice. I considered the case sufficiently curious to keep the bottle for some days to show some friends. The bottle was unbroken. What explanation could M. Barthelemy offer to this?—Yours, respectfully, A. L. HENDERSON."

A letter from Mr. D. Forbes, F.R.S., in *Scientific Opinion*, also refutes M. Barthelemy. Mr. Forbes says:—

"The behaviour of water under these circumstances is so intimately connected with the study of many important natural phenomena, that from a very early period it became the subject of rigid scientific investigation, the result arrived at being that water, if cooled, contracts until it acquires a temperature of 40° (4° C.), when it attains its maximum density, but that afterwards it expands to the freezing point.

"The fact of ice swimming upon water would in itself indicate that an expansion had taken place; but the experiments of Hope, Hallstrom, Despretz, and others, appeared to have settled this question beyond even a shadow of a doubt, and to render any further evidence quite superfluous."

"Now as to the question of the gases. To dispel any doubts on this head also, the following experiment was made yesterday:—A quantity of pure distilled water, in a flask, was boiled for some time until every trace of gas had been evolved, and then cooled down to near the freezing point. A bottle completely filled up with this gas-free water, at this low temperature, was hermetically closed, and the water inside converted into ice (by using a frigorific mixture of sulphate of soda with hydrochloric acid): the bottle was at once split to pieces by the expansion of the water, which, of course, could not have taken place had M. Barthelemy's new theory been correct."

VISITS TO NOTEWORTHY STUDIOS.

MR. SAWYER'S STUDIO AT NORWICH.

In the course of our recent visit to Norwich during the meetings of the British Association, we visited the studio of Mr. J. R. Sawyer, which possesses some especial points of interest, as yielding very good work with a very unusual kind of lighting. As Mr. Sawyer was engaged in taking the portraits of the principal members of the Association for publication, and his studio and reception room were, when we called, thronged with *savans*, ready to sit, our examination of the arrangements was necessarily hasty, and our description must be brief.

Passing through a handsome shop, devoted to the sale of optical instruments and other wares with which we have no concern, we will pass on, and, neglecting the reception room for the present, ascend to the studio, which is at the top of the building, and extends nearly over the whole of its area. It is 33 feet in length by 24 feet in breadth, the portion in use being a square space of 24 feet; there is no side light whatever, all the light entering through a glazed ridge roof, 18 feet high at the ridge, and 12 feet high at the eaves. The only light entering the studio is through this lofty skylight, which extends all over the studio; but the light so admitted is not generally permitted to reach the sitter directly. A series of narrow vertical blinds, arranged somewhat on the principle identified with Mr. McLachlan's name, cut off the direct light from reaching the sitter. A considerable flood of soft diffused light seems to fill the room, and the direct illumination of the sitter is effected by means of ingeniously contrived reflecting screens. These consist of light frames, some 6 or 8 feet long by 3 feet wide, covered with white calico. These are placed in different parts of the room, at various angles, as circumstances may render necessary. When we inspected the studio, the screens in use were leaning against a wall at an angle of about 30° at the side and a little in front of the sitter, whose face would receive a strong reflected light from the screens so placed.

At first sight nothing would appear more opposed to the recognized conditions of perfect lighting. The general rule is to have as much direct light as can be used, and as little diffused light as possible; to have, in fact, no light in the studio except that which directly illumines the subject to form the picture. Here we have the studio filled with soft, diffused light, and some portion of the direct light, which

enters the room, but does not reach the sitter, received by reflecting screens and thrown on him and on the accessories at second hand. Nevertheless, such a mode of lighting having been thoroughly mastered, Mr. Sawyer assured us he preferred it to any other, as it gave him more varied control over the light, and permitted more varied effects than could be readily produced by a direct light, which would be much less completely under control. Any modification of the angle, of the position, or of the number of reflecting screens, he stated, gave a modified effect in the light and shade and in the quality of the modelling, whilst the amount of light was quite sufficient for rapid working, the exposures averaging from eight to ten seconds on a day with light clouds, using Dallmeyer's and Voightlander's card lenses.

The work produced in the studio was very good, generally tending to vigour and brilliancy. In such of the portraits of members of the Association as we have seen, no indication of lack of direct light is perceptible, and amongst the specimens in the reception-room were many examples of very excellent and artistic work. The lesson we deduce is, that this is the most convenient and efficient form of lighting, but that a skilful man will produce good work under almost any conditions when he has become familiar with them. Mr. T. R. Williams works in a studio with a top light only, but which, by skilful arrangement of blinds, he converts practically into a high side-light. Whilst Mons. Adam-Salomon's best pictures are produced in a studio with a high side-light, facing north, he at times works from choice in a studio facing the south, without any clear glass to admit direct light whatever; and nothing can exceed the beauty of the pictures produced in this studio. Such facts may afford encouragement to those who must obtain their light as they can, and not as they would; but it will not induce any one as a matter of choice to select the conditions involving the most trouble.

In the reception-room we found many evidences of artistic taste. One fine portrait of a lady attracted our attention from its admirable reproduction of the position in the well-known painting of Titian's daughter. Some fine examples of the carbon process were hung around; and Mr. Sawyer's enlargements are some of the finest we have seen.

A startling estimate of the enormously large number of card photographs which must have been produced throughout the country is suggested by the figures Mr. Sawyer gave us. Very many flourishing photographic establishments now in existence sprung up, we know, during and in consequence of the card mania, and only imperfect statistics could be gleaned from such. Mr. Sawyer has been engaged as a professional photographer in Norwich for fifteen years: it is of course only during the last eight years that any serious accumulation of negatives can have taken place; nevertheless, he has stored and registered 25,000 negatives, each containing two different positions—practically, 50,000 negatives in one provincial establishment, making an average of 6,000 negatives a year during the period which has elapsed since cards were introduced. The average number of card prints issued from his establishment, Mr. Sawyer states to be about 50,000 per annum.

ON A NEW SERIES OF CHEMICAL REACTIONS PRODUCED BY LIGHT.

BY JOHN TYNDALL, LL.D., F.R.S., ETC.*

I ASK permission of the Royal Society to draw the attention of chemists to a form or method of experiment which, though obvious, is, I am informed, unknown, and which, I doubt not, will in their hands become a new experimental power. It consists in subjecting the vapours of volatile liquids to the action of concentrated sunlight, or to the concentrated beam of the electric light.

* Communicated to the Royal Society.

ACTION OF THE ELECTRIC LIGHT.

A glass tube 2·8 feet long, and of 2·5 inches internal diameter, frequently employed in my researches on radiant heat, was supported horizontally. At one end of it was placed an electric lamp, the height and position of both being so arranged that the axis of the glass tube and that of the parallel beam issuing from the lamp were coincident. The tube in the first experiments was closed by plates of rock salt, and subsequently by plates of glass.

As on former occasions, for the sake of distinction, I will call this tube *the experimental tube*.

The experimental tube was connected with an air-pump, and also with a series of drying and other tubes used for the purification of the air.

A number of test-tubes (I suppose I have used fifty of them in all) were converted into Woulfe's flasks. Each of them was stopped by a cork, through which passed two glass tubes; one of these tubes (*a*) ended immediately below the cork, while the other (*b*) descended to the bottom of the flask, being drawn out at its lower end to an orifice about 0·03 of an inch in diameter. It was found necessary to coat the cork carefully with cement.

The little flask thus formed was partially filled with the liquid whose vapour was to be examined; it was then introduced into the path of the purified current of air.

The experimental tube being exhausted, and the cock which cut off the supply of purified air being cautiously turned on, the air entered the flask through the tube *b*, and escaped by the small orifice at the lower end of *b* into the liquid. Through this it bubbled, loading itself with vapour, after which the mixed air and vapour, passing from the flask by the tube *a*, entered the experimental tube, where they were subjected to the action of light.

The power of the electric beam to reveal the existence of anything within the experimental tube, or the impurities of the tube itself, is extraordinary. When the experiment is made in a darkened room, a tube which in ordinary daylight appears absolutely clean is often shown, by the present mode of examination, to be exceedingly filthy.

The following are some of the results obtained with this arrangement:—

Nitrite of Amyl (boiling point 91° to 96° C.).—The vapour of this liquid was, in the first instance, permitted to enter the experimental tube while the beam from the electric lamp was passing through it. Curious clouds were observed to form near the place of entry, which were afterwards whirled through the tube.

The tube being again exhausted, the mixed air and vapour were allowed to enter it in the dark. The slightly convergent beam of the electric light was then sent through the tube from end to end. For a moment the tube was *optically empty*; nothing whatever was seen within it; but before a second had elapsed a shower of liquid spherules was precipitated on the beam, thus generating a cloud within the tube. This cloud became denser as the light continued to act, showing at some places a vivid iridescence.

The beam of the electric lamp was now converged so as to form within the tube, between its end and the focus, a cone of rays about eight inches long. The tube was cleansed, and again filled in darkness. When the light was sent through it, the precipitation upon the beam was so rapid and intense that the cone, which a moment before was invisible, flashed suddenly forth like a solid luminous spear.

The effect was the same when the air and vapour were allowed to enter the tube in diffuse daylight. The cloud, however, which shone with such extraordinary radiance under the electric beam, was invisible in the ordinary light of the laboratory.

The quantity of mixed air and vapour within the experimental tube could, of course, be regulated at pleasure. The rapidity of the action diminished with the attenuation of the vapour. When, for example, the mercurial column associated with the experimental tube was depressed only five inches, the action was not nearly so rapid as when the

tube was full. In such cases, however, it was exceedingly interesting to observe, after some seconds of waiting, a thin streamer of delicate bluish-white cloud slowly forming along the axis of the tube, and finally swelling so as to fill it.

When dry oxygen was employed to carry in the vapour, the effect was the same as that obtained with air.

When dry hydrogen was used as a vehicle, the effect was also the same.

The effect, therefore, is not due to any interaction between the vapour of the nitrite and its vehicle.

This was further demonstrated by the deportment of the vapour itself. When it was permitted to enter the experimental tube unmixed with air or any other gas, the effect was substantially the same. Hence the seat of the observed action is the vapour itself.

With reference to the air and the glass of the experimental tube, the beam employed in these experiments was perfectly cold. It had been sifted by passing it through a solution of alum, and through the thick double-convex lens of the lamp. When the unsifted beam of the lamp was employed, the effect was still the same; the obscure calorific rays did not appear to interfere with the result.

I have taken no means to determine strictly the character of the action here described, my object being simply to point out to chemists a method of experiment which reveals a new and beautiful series of reactions; to them I leave the examination of the products of decomposition. The molecule of the nitrite of amyl is shaken asunder by certain specific waves of the electric beam, forming nitric oxide and other products, of which the *nitrate* of amyl is probably one. The brown fumes of nitrous acid were seen to mingle with the cloud within the experimental tube.

The nitrate of amyl, being less volatile than the nitrite, could not maintain itself in the condition of vapour, but would be precipitated in liquid spherules along the track of the beam.

In the anterior portions of the tube a sifting action of the vapour occurs, which diminishes the chemical action in the posterior portions. In some experiments the precipitated cloud only extended half-way down the tube. When, under these circumstances, the lamp was shifted so as to send the beam through the other end of the tube, precipitation occurred there also.

ACTION OF SUNLIGHT.

The solar light also effects the decomposition of the nitrite-of-amyl vapour. On the 10th of October I partially darkened a small room in the Royal Institution into which the sun shone, permitting the light to enter through an open portion of the window-shutter. In the track of the beam was placed a large plano-convex lens which formed a fine convergent cone in the dust of the room behind it. The experimental tube was filled in the laboratory, covered with a black cloth, and carried into the partially darkened room. On thrusting one end of the tube into the cone of rays behind the lens, precipitation within the cone was copious and immediate. The vapour at the distant end of the tube was in part shielded by that in front, and was also more feebly acted on through the divergence of the rays. On reversing the tube, a second and similar cone was precipitated.

(To be continued.)

ON PRODUCING OPEN-AIR EFFECTS IN THE STUDIO.

BY CHARLES E. PEARCE.*

When I promised, at the June meeting of the present year, to read a paper on the subject of double printing, I had hoped to have worked out a method which would enable us to introduce, with facility, backgrounds from nature into card and cabinet pictures—not merely a method by which,

* Read at a meeting of the South London Photographic Society, November 12, 1868.

after a great deal of vexation and a number of spoiled prints. one or two presentable examples might be obtained, but a practical method, to be introduced into the ordinary way of business. I have not been able to fulfil my intention at present. However, the subject of the paper this evening has somewhat grown from the preliminary preparations which were necessary to carry out the former idea.

To convey the impression of open-air scenes it is necessary to have the foreground arranged with natural objects; the ground must look like ground; the grass and shrubs must be real, or the deception will be at once apparent. And here, at the outset, is a difficulty which would require a number of "dodges" to overcome.

I dare say most photographers are familiar with the appearance of the studio when, in some moment of enthusiasm, they have essayed to produce an open-air scene, and have called in the assistance of natural objects. Everything of a vegetable nature within reach is pressed into service. Stones, straw, and I have even heard of cinders, are made available, and in five or six minutes the studio presents an appearance of something between a stable and a pigsty; and, if these "accessories" are suffered to remain until next day, the appearance of the whole, with its drooping grass and leaves, is thoroughly wretched. The room has to be cleansed before a fresh sitter can be introduced, and the photographer is tempted to make a vow that he will have nothing henceforth to do with natural properties, until a fresh resolution seizes him, and the same scene is re-enacted.

I felt, on commencing these pictures, that it was absolutely necessary to have some control over the foregrounds; that they should be ready at a moment's notice; that they should be portable, and present somewhat of an orderly appearance. These desiderata, to a certain extent, I have obtained, and have no difficulty in arranging foregrounds with the same grass and bushes that I used during the summer months.

I first tried the plan of a wooden tray, about six feet long by two feet broad, containing mould in which weeds and grass were planted. This I soon gave up; it was unwieldy and awkward to use, and, although quite large enough to be continually in the way, was not large enough to produce any effect without the assistance of other objects.

The next idea was to form a permanent ground which would be always ready, with plenty of room to place the sitter and to build up the foreground in parts; and that is the plan I now adopt, and which I find most convenient. The ground may be formed of canvas or carpet (of course, quite plain). I myself use a material termed "wincey," which I found was suitable and cheap. Over this is strewed a little hay, and it is on this account that a fluffy material is best, because the hay adheres to it, and is prevented from littering the other parts of the room. The grass is kept available by planting tufts in wooden boxes. The boxes are about nine or ten inches square, and the sides about an inch and a quarter high. The grass is simply dug out in patches, with the mould adhering to the roots, placed in the boxes; and the blades falling over the sides entirely conceal the framework. Any number of these boxes can be made; some I have contain common weeds, such as groundsel, nettles, docks, &c., which are very effective, and the whole being easily moved about, the arrangement can be varied without any trouble.

A weed, a sample of which I have brought to-night, I have found very useful. The leaves and stalks are of a very hard nature, and, when dried, retain their shape perfectly; the flower, which is something like that of groundsel, goes to seed on drying, but retains its shape for a considerable period, and the whole photographs remarkably well. This I turned to account in the manufacture of bushes, by tying the stalks together in bundles, and then nailing these bundles in layers to pieces of wood, arranging them so as to make the loose part of one bundle cover the nailed part of another. The wood having a foot to enable it to stand up-

right, the bush is complete. I do not apprehend there would be any difficulty in procuring weeds of a similar character—sorrel possibly might be useful in this way; but, at all events, weeds of a soft, succulent nature are unsuitable, and not fitted for drying.

Another picturesque object will be found in the stump of a tree; it need not be very large, and if it has many roots attached to it, so much the better. The long, dried, feathery grass can be had cheap, and will be found very useful.

Some might be disposed to say, Why go to the trouble of making artificial bushes when living plants can be obtained. But I think the necessity of concealing the flower, pots will be found an inconvenience, to say nothing of the risk of damage to which they are constantly exposed; for instance (I speak from experience), a lady's dress catching in part of the plant, and turning it, together with the mould, on to the floor. However, if any be disposed to living plants in pots, the box tree, arbor vitæ, and American aloe may be suggested as being suitable; and, if placed behind some of the artificial bushes, will have a good effect.

With regard to introducing water into the picture, I have endeavoured to produce the effects with sheets of polished tin; with what result these pictures will show. I should be glad if any member, who has seen real water introduced into pictures of this kind, would point out the defects and the difference between the real and the imitation. The tin has at least the merit of being exceedingly convenient to use. The shape of the water can be altered at will, and a few imitation flags, or a stone placed so as to show the reflections, will assist in giving the appearance of water.

With regard to the backgrounds. That every photographer should paint his own I regard as a *sine quâ non*, and it will be found desirable to have it as large as the room will permit, so as to prevent the necessity of using exactly the same portion for each picture. The chief point to be observed in the background is the agreeable distribution of light and shade, so as to be in harmony with the rest of the picture; and, while giving force to the figure, at the same time producing an effect of atmosphere. Of course, each man must judge for himself the kind of background best suited to his method of lighting. As to the amount of scenery represented, the less there is the better. I have found the indication of a clump of trees to be quite sufficient. One important point to be observed is to have the sitter a considerable distance in advance, so as to throw the background well out of focus, and also to separate it from the figure.

Concerning the vexed question of the horizon: whether it should be high or low, I do not pretend to decide; but, for my own part, I am inclined to give the preference to a position about one-third or a little more from the bottom of the picture. In most cases, if it be merely suggested, and no distinct line made out, it will be all that is necessary.

In conclusion, I would say that I do not offer these pictures as specimens of photography, but simply as the result of an endeavour to extricate oneself from the groove into which photographers appear to have fallen; and however imperfect these attempts may be, the pleasure I have derived and the instruction I have gained, perhaps unconsciously, have more than rewarded me for the trouble.

There is one quality which particularly recommends this class of picture, and that is the infinite variety one may obtain with a few materials—an advantage which every photographer who pins his faith to chairs and tables must have sighed for in vain. It not only takes away the machine-like character which too many photographs, excellent in other respects, have, and gives an individuality to each picture, but it stimulates the invention of the photographer, which must necessarily benefit him.

I have only to say that if we endeavoured to originate, and not be content with slavishly copying each other, we should feel more interest in our work, and instead of sitting down and saying complacently, "The public will have this and no other," we should try to educate the taste of the public,

who are not so blind as some of our brethren would have us believe; and we should find ourselves repaid, not only in the additional instruction we should gain, but in a much more material sense.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.
CHAPTER XLII.

As this is my penultimate chapter, I take the opportunity of introducing an example of portraiture, that I may say a few final words on that important subject to the photographer.

The illustration is engraved from a picture by Desanges,

one of the most graceful portrait painters we have, but who, perhaps, will be better known to the reader as the painter of the Victoria Gallery, illustrating the principal actions for which the Victoria cross was awarded, and which for some years formed one of the chief attractions of the Crystal Palace. In this picture will be found nearly every quality that goes to the making of a good portrait—breadth, simplicity, and unity; balance, contrast, and variety. It is dignified and graceful, refined in feeling and expression, and the figure is set before the spectator for itself alone, and without any distracting embellishments which, without adding to the interest of a portrait, often suggest departure from truth. Our illustration is a reduction, by Mr. Fruwirth, of a wood engraving in the *Art Journal*.

Photographic portraiture has not, in a broad sense, yet arrived sufficiently far on the road to perfection to make its



professors as a body very proud of their art, but during the last two or three years it has made great strides. Several causes have combined to help it to advance more rapidly of late than in former years. The exhibition of M. Adam-Salomon's pictures last year at the French Exhibition, and their introduction to the great body of English photographers by the Editor of the *News*, gave an enormous impulse to the production of good work; even those who most believed in the beauty of their own work saw that

in photographic portraiture there was something beyond; they saw a certainty that the end of the art had not been reached, and these pictures gave the promise of a possibility of something still more glorious being achieved in portraiture by their art. Some were, no doubt, sorry for this, as they felt they must give up the hope of ever approaching the works of the great master; while others, more reliant and hopeful, buckled on their armour, and fought honestly to win some honour in the same path. Whether many will

ever equal the original works is problematical; but the present result is not doubtful—better work has been done. That this is so was almost ludicrously shown at the Exhibition of the Photographic Society recently held, the walls having been covered by portraits of every degree of merit, from the lowest to the highest, which had evidently been inspired by the works of M. Salomon. Deprecating, as I do, this servile copying of any man's work, to which English photographers, for lack of originality in themselves, are much too prone, it must be patent to all impartial minds that an advance has been made in photographic portraiture all over the country which could scarcely have been anticipated or believed. Photographers have shown that they have the capacity to imitate a good thing; let them advance another and yet more difficult step: those who follow are always behind; let them rise above mere imitation, and produce original works. There is one fault visible in most of these "Salomoniac" pictures from which even the originals are not quite free, and against which it is perhaps as well to warn the student. In the endeavour to arrive at technical excellence and fine chiaroscuro, expression seems to have been almost forgotten, and the portraits suffer from the neglect.

Another cause of the improvement in the art has been the depression in the *business*. Many who were not fitted for it have had to return to their former employments. It is, perhaps, a cruel thing to say, but the art is all the stronger because the weak ones have been killed off. The public, who would take any rubbish a few years ago, is now more discriminating, and will not accept bad pictures, however cheaply (I would rather say low in price, for bad things are not cheap) soot and whitewash abortions may be offered by despairing "artists" who have mistaken their vocations. But one of the chief causes for this cheering advance in the quality of the pictures produced at the present time—if I may say so without being thought to refer to my own writing—is the sound and practical art knowledge that has been given to photographers of late years by the PHOTOGRAPHIC NEWS, and which is so opposed to the mystic and "high-falutin" substitute for common sense with which the art had been previously surrounded.

Before the advent of these several causes of improvement, the art, except in the hands of a few, was very like that described by the Vicar of Wakefield, when he tells us of the painting of his great family picture. As ridicule is sometimes as good a teacher as sober sense, I am tempted to extract the passage.

"My wife and daughters, happening to return a visit at neighbour Flamborough's, found that family had lately got their pictures drawn by a limner who travelled the country and took likenesses for fifteen shillings a head. As this family and ours had long a sort of rivalry in point of taste, our spirit took the alarm at this stolen march upon us, and, notwithstanding all I could say—and I said much—it was resolved that we should have our pictures done too. Having, therefore, engaged the limner, our next deliberation was to show the superiority of our taste in the attitudes. As for our neighbour's family, there were seven of them, and they were drawn with seven oranges—a thing quite out of taste, no variety in life, no composition in the world. We desired to have something in a brighter style; and, after many debates, at length came to a unanimous resolution of being drawn together in one large historical family-piece. This would be cheaper, since one frame would serve for all, and it would be infinitely more genteel; for all the families of any taste were now drawn in the same manner. As we did not immediately recollect an historical subject to hit us, we were contented each with being drawn as independent historical figures. My wife desired to be represented as Venus, and the painter was requested not to be too frugal of his diamonds in her stomacher and hair; her two little ones were to be as Cupids by her side; while I, in my gown and band, was to present her with my books on the Whistonian controversy. Olivia would be drawn as an Amazon, sitting upon a bank of flowers, dressed in a green Joseph richly

laced with gold, and a whip in her hand; Sophia was to be a shepherdess, with as many sheep as the painter could put in for nothing; and Moses was to be dressed out with a hat and white feather."

Everybody remembers—for it has become proverbial—the fate of this grand historical portrait picture: how it was too big to allow of its being got through any of the doors of the house, and how it was obliged to remain in the kitchen. The description of it is but a very slight exaggeration of the absurd anaæronisms perpetrated in the last century, a subject on which I touched in Chapter 26. And do not we now, in the nineteenth century, when everything is matter-of-fact, see in photography, which should not lie, the most absurd, the most grotesque blunders possible? Columns, curtains, pedestals, profile pianos, pilasters, sham windows, wooden fireplaces,—do not these words call up visions of artistic abominations, horrible to the now more cultivated eye? It has been the reproach of photography that its results fade. The fault I find with it is, that they are too permanent; and early, and to me awful, prints are continually rising up in all their ghastliness to shame their makers.

What photographer takes up an old album in a friend's house without a sort of fear of opening it, and being reproached by his own handiwork? But he may take heart of grace; the very disgust he feels at looking at his early productions shows that he is not only a better photographer and a better artist now than he was then, but that he is on the way to still greater success.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held in the City of London College on the evening of Thursday, November 12th, the Rev. F. F. STATHAM, M.A., in the chair.

The minutes of a previous meeting having been read and confirmed, the following gentlemen were elected members of the Society: Messrs. F. East, C. Annand, and J. Quarm.

The CHAIRMAN then announced that the presentation prints were ready for distribution, and also reminded members that the subscriptions for the current year were due. He also announced that the annual dinner of the Society would be held on the evening of Saturday, the 12th of December, at the same place and hour as last year; due notice of details would be given by circulars addressed to the members.

A frame of Mr. Henderson's very fine enamels were exhibited, and a conversation thereon followed, in the course of which Mr. Henderson stated, in answer to a question, that the cost of a large specimen, in the Chairman's hand, would be about 15s., with 30 per cent. discount off.

Mr. C. PEARCE then read a paper "On Producing Open Air Effects in the Studio" (see p. 556). The paper was illustrated by some very excellent examples of card portraiture by Mr. Pearce; and Mr. Taylor passed round some examples of cards with landscape backgrounds by Mr. Parry, of Preston.

The CHAIRMAN, in offering to Mr. Pearce a vote of thanks, spoke of the interest he felt in seeing photographers endeavouring to get out of the common-place groove, and aim at more specific pictorial effect in portraiture.

An animated but desultory conversation followed, in which the Chairman, Mr. Bockett, Mr. Simpson, Mr. Pearce, and others took part.

Mr. SEBASTIAN DAVIS, referring to the landscape backgrounds, remarked that he did not think the horizon line should be placed too high, as it detracted much from the effect of the figure.

Mr. PEARCE said it would, of course, be opposite the eye of the spectator; or, in photography, opposite the lens or eye of the camera.

Mr. DAVIES said, of course, and for that reason the latitude the photographer had in fixing the height of his camera gave him some latitude in respect to the horizon line.

Mr. HART suggested that when a background contained open air effects it was important to avoid the strongly marked

light and shade on the face, which indicated that the figure was really taken in a studio. Especially the portraits should not have one side of the face in deep shadow.

Mr. PEARCE said, undoubtedly portraits with landscape backgrounds should be well exposed; but at the same time, he thought a slight sacrifice of literal truth might, without serious impropriety, be made to pictorial effect. It was done by artists constantly, as might be seen on consulting any collection of engravings.

Mr. DAVIS thought that much would depend on circumstances. Even in the open air strong effects of light and shade would often be observed. In Mr. Robinson's "Returning Home" the face was, in some degree, in shadow, but the character of the light and sky seemed to justify it.

Mr. HART said the hat in that case over-shadowed the face.

Mr. SIMPSON thought that whilst circumstances might often produce a face in the open air with strongly marked light and shade, yet, as a general rule, observation of Mr. Hart's suggestion was most important. It was certainly incongruous to see a figure in an open plain, yet distinctly lighted with the side-light of a studio. As a rule, open air lighting had the effect of top-lighting.

After some further conversation the subject was dismissed.

Mr. Taylor exhibited Messrs. Geymot and Alker's *Jumelle Photographique*, an opera-glass camera, with a changing box to hold fifty dry plates, about one and a half inches square. This box was very ingeniously contrived, being circular, with fifty grooves radiating from the centre like the spokes of a wheel. Each groove could be brought in succession opposite an orifice, from whence it was dropped, when required, into the groove in the camera for exposure. The attachment between the changing box and camera was provided with an automatic arrangement, by which both apertures were closed by the act of detachment.

Mr. TAYLOR said that some little attention having recently been called to miniature cameras, he thought that this might interest members. He did not introduce it as a new thing, for it had been described early in 1867.

After some conversation,

Mr. HOWARD exhibited a very charming series of landscapes, the results of his summer rambles. He called attention, as a feature of interest, to the fact that these pictures were taken two on one plate, $7\frac{1}{2}$ by $5\frac{1}{4}$ in size, the two halves exposed in succession, thus giving the prints about $3\frac{1}{2}$ by $2\frac{1}{2}$. He found the plan very convenient with his camera intended for $7\frac{1}{2}$ plates. Some of the collodio-albumen plates had one-half exposed five minutes, and the other half only a few seconds, so that a little judgment and skill in development had been necessary; but he had found no serious difficulty.

After some conversation and much admiration of the charming little views, the subject was dropped.

The CHAIRMAN mentioned that in the *Mirror* for 1826 he had recently noticed a photographic experiment mentioned. A bottle was filled with some lime-water, to which a little nitrate of silver was added, and the bottle was covered with paper in which some device was cut out, and then submitted to the action of light. It was interesting as one of the pioneer experiments in the art.

Some conversation as to the consideration of certain questions in the Question-Box took place, and it was resolved that should no paper be provided, Mr. Davis should introduce the first question at the next meeting, which was as to the cause of pinholes in dry plates. The subjects of other questions were apportioned to other members, who were requested to give them a little consideration, and introduce them when occasion occurred.

The proceedings then terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of the above Society was held on Tuesday, the 17th inst., at 12, York Place, Portman Square, JAMES GLAISHER, Esq., F.R.S., in the chair.

The minutes of the last meeting having been read and confirmed, the following members and subscribers were elected:—Captain Grimston, Captain Arbuckle, R.M., W. H. Saville, Esq., R. E. Chidley, Esq., Mrs. Leslie, J. B. Hodgkin, Esq., Robert Brown, Esq., F.R.C.S.E., Rev. T. Hedley, Arthur Lascelles, Esq., F. S. Schivale, Esq., E. Hoasman, Esq., Ed. Roper, Esq.

The Secretary then laid before the meeting the pictures for

the current year, which greatly exceed in number those of any previous occasion; it was, however, found impossible to come to a decision relative to the prizes that day, and the meeting was therefore adjourned A. J. MELHUISE, Hon. Sec.

Correspondence.

LUX GRAPHICUS ON THE WING.

HIS FLIGHT TO AND FROM THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

DEAR MR. EDITOR,—On Tuesday night last I took the liberty of looking into the rooms of the Architectural Society, to see the photographs, and listen to the gossip of the visitors at the conversazione of the Photographic Society. To hear the complimentary remarks and the exclamations of pleasure was as delightful to my ear as the first song of the lark in spring.

The assemblage—not brilliant, but genial, pleasant, and happy—was as refreshing to the eye as the first glimpse of the vernal flowers; and the pictures hung upon the walls and screens, and laid upon the tables, were, in more senses than one, a feast to the mind almost without alloy. For my own part, I felt so joyful, I could not help fluttering my wings, shaking my feathers, and flitting about from one place to another, chirping, chattering, and pecking lovingly about this pretty thing, and at that old friend, till long after my usual time of going to roost. And when I did at last tear myself away and fly home, I could not help exclaiming, Well, there never was a pleasanter evening nor a nicer exhibition in the whole history of the Society! But I could not sleep; I put my head under my wing, shook my feathers, and tried to settle into the most comfortable and cosy positions, but it was no use. The pretty landscapes and pleasing portraits I had seen shone brighter and brighter before me; I was compelled to mentally review them; and here follows the result of my incubations. My first thoughts were to work the pleasures of the evening by a kind of rule-of-three process, by considering the value of the landscapes and portraits exhibited, to arrive at the worth of the exhibition, but not so much in a money point of view, as in the merits of; the works, and their probable influences on the workers.

Taking the landscape portion of the exhibition, as first in the order into which I had mentally catalogued the pictures, it was an easy and delightful thing to skim over such a vast extent of this world's surface that evening. To journey to and from the glens of Scotland, the dales of England and Wales, the lakes of Ireland, the mountains of the Tyrol, to Abyssinia and the famous heights of Magdala, was but the work of a few minutes, thanks to the purveyors of that mental banquet. But to do full justice to the exhibitors I must endeavour to enumerate their principal works, and comment thereon with the utmost impartiality. Most unquestionably the gems of the landscape portion of the exhibition were eight exquisite little pictures by Mr. Russell Mannors Gordon, affording unmistakable proof of what the gum-gallico dry process is capable of yielding in his hands. It is almost, if not quite, equal to the wet process for detail and delicacy. This is particularly noticeable in the view of Carnarvon Castle. Indeed, Mr. Bedford's picture of the same subject—which, I presume, is by the wet process—on the other side of the screen, contrasts rather unfavourably with it. Mr. Gordon's selection of his point of sight, and general treatment of that subject alone, are unmistakable proofs of his refined taste and feeling for the art capabilities of landscape photography. The wet-collodion pictures by Mr. Gordon are also beautiful examples of the art. His cottages with sheep browsing in the foreground, which is an instantaneous picture, is remarkable for its beauty and arrangement. These pictures are beautifully printed, and possess a tone which harmonizes charmingly with the subjects. Amongst the other landscape photographers Mr. England and Mr. Bedford stand unrivalled in their peculiar branches. The views in the Tyrol, lately taken by Mr. England, are so excellent that they cannot but add to that gentleman's high reputation.

Mr. Bedford's views are also quite equal, if not superior, to his previously exhibited works. Some pretty views of the Lakes of Killarney by Mr. Archibald Irvine were well worthy of notice. Mr. F. Beasley, Junr., exhibited some very excellent examples of the Fothergill process; some printed in silver, and others in carbon, from the same negatives. I think the carbon

prints were superior in colour, but the silver prints possess most detail and depth. Views of Wimbledon and other places by Mr. Vernon Heath were also good examples of that gentleman's photography. Some beautiful cloud effects by Messrs. Robinson and Cherrill, of Tunbridge Wells, and Mr. Fox, of Brighton, attracted considerable attention, and elicited great praise. The large composition picture, "Returning Home," by Mr. Robinson, was greatly admired by nearly everyone that looked at it. One or two ill-natured or ignorant remarks were made about that picture, but I candidly think it is the very best picture that Mr. Robinson has produced. The sunshine on the one side of the picture, and the rain storm sweeping over the other, are both cleverly and artistically managed. I am sorry I cannot say the same of the group of children which hung near the latter. The group, though perfect in its photographic details and tone, is too suggestive of scissors and paste to be a good picture, in my estimation.

Mr. Wardley's large Taupenot pictures were very excellent. The very interesting pictures of Abyssinia by the 10th Company of Engineers were very attractive. Groups of the captives—political, religious, and artisan, with their families—and the officers of the Expedition formed interesting pictures. The views of Magdala, Theodore's house, the mushroom fortifications, and other flimsy defences, as revealed by the truth-telling camera, seemed to lessen considerably the glory of the capture of Magdala.

Having dismissed the landscape portion of the exhibition without mentioning all the many excellent contributions thereto, I next turned my thoughts again to the contributions of portraits. Two examples of that branch of photography were nearly all of first-rate excellence, a large number of them being *à la Salomon*, M. Adam-Salomon himself contributing no less than fifteen. With one or two remarkable exceptions, these pictures were not equal to those exhibited last year, and a general feeling prevailed that they were neither his later works, nor the best of his former; still, they were a very effective display, and attracted great and deserved attention. As I have, on a former occasion, expressed my opinion on the great excellence of M. Salomon's works, I shall not comment further thereon at present, but proceed to notice those which most nearly approached them in photographic and artistic essentials. Undoubtedly Mr. Valentine Blanchard's contributions, both in number and quality, come nearer to M. Salomon's works than any other contributor's. Mr. Blanchard exhibited ten portraits *à la Salomon*, some of which are quite equal to the French artist's best works, without the elaborate working-up which the latter exhibit. Mr. Blanchard has not been at all times fortunate in his sitters, which is very much to be regretted, for we all know how much a beautiful subject helps a good photograph. Hitbarto, Mr. Blanchard has been an exhibitor chiefly as a landscape and figure-study photographer. Now that he has taken more kindly to portraiture, and exhibits such capabilities for its successful practice, I hope he will find it sufficiently remunerative to induce him to be a steady and persevering disciple of M. Salomon. Messrs. Robinson and Cherrill also exhibited two beautiful and Salomon-like portraits: one of M. Salomon himself, and one of Mr. Hain Friswell; the latter, I think, is decidedly the best. Mr. Mayland, of Cambridge, sent six very excellent portraits in Salomon's style, all very good but one; a gentleman in a velvet coat was particularly successful.

The pictures exhibited by Mr. Briggs, of Leamington, though extremely forcible and beautiful, were not exactly an imitation of the style of M. Salomon.

Mr. Leake, of Cornhill, had a frame containing six very capital portraits in the style of the eminent French photographer, but a little over-done in after-touching—too much elaborated. In this respect he far outdid his great prototype. Messrs. Fradello and Leach also exhibited a number of whole-plate pictures *à la Salomon*, which were very good indeed. Messrs. Slingsby, Burgess, Ashdown, Dunmore, and S. Fry, were also exhibitors of the same style of portraits, ten by eight size; but it is a pity the latter did himself the injustice of exhibiting so many, for there was only one—an old gentleman with a grey beard—that was really worthy of him. Never did any man's joke recoil more forcibly on himself than that of Mr. Fry's. The faces of some of his female portraits—one in particular—were, in my estimation, as flat, white, and shadowless as a piece of knob of sal-ammoniac itself; but I must say that the portrait of the gentleman above referred to was all that could be desired as an artistic photograph.

Amongst the cabinet pictures exhibited by English photographers, I think those by Mr. Hubbard were decidedly the finest. One entitled "The Toilet," and another of a lady seated at a window, which might be named "A Sultry Day in Town," are charmingly artistic photographs. A composition picture by the same artist was also very skilfully treated; indeed, it was mistaken by many to be a copy of a picture, and might easily have been taken for a copy of a painting by T. Faed. Mr. Briggs, Mr. Godbold (of Hastings), Mr. Gillo, Messrs. Lucas and Box, also exhibited some beautiful cabinet pictures.

Cartes-de-visite in their ordinary form were somewhat scarce, but Dr. Wallich, Mr. Charles Heath, Mr. Bateman, and others, made a good show of vignettes.

Mrs. Cameron exhibited some large pictures in her peculiar style; but my own opinion and that of others was, that she is improving.

Mr. Ernest Edwards exhibited a large collection of carbon pictures, in black and other colours; some mounted on chromo-tinted paper, and some excellent enlargements in carbon. The Autotype Company exhibited a fine copy of Lord Belhaven, which I noticed some time ago; also a very valuable and beautiful collection of copies from drawings by old masters, all bound together, making a handsome and very interesting collection.

Mr. Rejlander had a large collection of his art photographs on view, all of which were clever, some facetious and many very beautiful conceptions.

A frame of coloured enamels by Mr. Bailey, and some in black-and-white by Mr. Henderson and Mr. Barnes, also attracted considerable notice.

The chburneumtypes by Mr. Burgess, a coloured collodio-chloride portrait on ivory by Mr. J. Edwards, and other collodio-chloride and opalotype pictures, were very much admired. The cabinet vignettes by Reutlinger, and the cabinet pictures by Wendoroth, were both in request at the table, on account of their beauty and interest.

I must not forget to mention a very interesting series of twenty-four stereoscopic pictures by Mr. Alfieri, illustrative of "The Potter's Art."

Mr. Jabez Hughes and Mr. Meagher were both exhibitors of very excellent and useful apparatus—cameras, camera-stands, and rolling presses.

Now I think such an exhibition as I have but partially described cannot fail to have produced a pleasing and beneficial effect on the minds of all who saw it, and ought, on the whole, to have given infinite pleasure and satisfaction to both exhibitors and visitors. Yet I think I heard one or two growls of discontent about the hanging from some one whose pictures or whose friend's pictures were not on the line; but I think I may safely say there never was a case of hanging yet that was not objected to by one individual at least. Even the hangers of the Royal Academy do not escape censure, and they are supposed to have far more skill, taste, and experience in hanging than the volunteer hangers of the late photographic exhibition. I think, however, that the hangers performed their duties both conscientiously and creditably, especially when it is considered in how very short a time the work had to be done. Any one who felt aggrieved, and expressed himself churlishly on that point, must surely have been in that unenviable state which the French very adroitly designate *Etre marqué au B.*

After these reflections I felt too drowsy to reflect any more, and was barely awake enough to subscribe myself—Yours very truly,
LUX GRAPHICUS.

November 10th, 1868.

ALBUMINIZED PAPER AND PRINTERS.

SIR,—In reply to Mr. Bovey, I would ask you to publish the following, after which I shall not again trouble you upon this subject, as it is not worth while to continue a discussion which, however useful it might be in the abstract, or however interesting in its practical application, seems to be somewhat distasteful to your correspondent.

I will confine my attention to the more practical part of Mr. Bovey's communication.

The "three questions" which Mr. Bovey put to me to answer have nothing whatever to do with the matter on hand, and the very fact of Mr. Bovey putting them in the manner which he has adopted, shows how completely he has mistaken both my object and my meaning. I will, however, consider them.

First. It is not of the slightest consequence to me how much albumen each sheet of paper absorbs; that is a question which belongs entirely to the makers of albuminized paper. All that I want to know in respect of quantities is, speaking roughly, how much silver it will take to sensitize a quire of a certain sample of paper.

Second. It is no consequence to me what amount of silver goes to the albumen, and what to the salt, so that I know, speaking roughly, how much silver it will take to sensitize a quire of a certain sample of paper.

Thirdly. If photographers knew how much silver each quire of paper removed from their sensitizing bath, they could easily ensure uniformity in their solutions which would be sufficient for all practical purposes; they do so now, but if some information were given them as to the amount of silver used, it would be easier.

Mr. Bovey will observe here that I have never laid any stress upon the importance of knowing the strength of salting solution, &c. I have only said that a little information on this subject would be useful; and so I hold it would.

The important part of the matter is yet to come; what has gone before has been only preliminary. I hold that it would be a great advantage to photographers generally if they knew what intensity of negative would produce the best result with each sample of paper sent them; as it is, with every sample of paper, it has to be made a matter of experiment. I do not, and never did, ask for the "uniformity" which Mr. Bovey wishes to speak of; nor is the sense of my paper such ridiculous nonsense as Mr. Bovey tries to make out. Here is the point, in Mr. Bovey's own words: "Hence the Saxe paper* yields an image of lesser vigour than can be secured with the Rivo sample." Now, the information I want is, what must be the comparative intensities of two negatives, the one to print best on one paper, and the other on the other paper? I am perfectly aware that there is no standard at present by which the comparative densities or intensities of negatives can be compared; but the adoption of such a standard was the very point which I ventured to suggest at the North London meeting. I said it would be a good thing if such a standard were adopted. If such were the case, the more different kinds of paper we had the better, so that each might be uniform with itself, and each having some definite relation to the other. Yours truly,

NELSON K. CHERILL.

THE LATE SOLAR ECLIPSE.

SIR,—I see a letter in your Journal from Dr. Vogel, giving an account of his photographic operations during the eclipse of the sun at Aden. He states, incidentally, that Dr. Weiss, of Vienna, first called attention to this eclipse. Dr. Vogel, probably, saw only the *Astronomische Nachrichten*; but Dr. Weiss was not the first to notice it. A letter of mine to the Secretary of the Royal Astronomical Society is in the January number of their Notices, and you will find more information than Dr. Weiss gives (before his publication) in the number for March of the Notices. My paper was ready on the 1st February, and I had communicated both with the Astronomer-Royal and the Director of the Imperial Observatory at Paris before the reading of my paper, which was necessarily deferred, owing to the Annual Meeting of the Astronomical Society in February.

I am happy to say I, too, have six photographs, done by a Serjeant and two Sappers of the Royal Engineers under my superintendence, and I have myself examined the spectra, both of the great horn described by M. Vogel, and of the corona. The polarization of their light was examined by Captain Branfill, of the G. T. Survey.

When our photographs were taken (at Guntoor) the height of that horn was 90,000 English miles, or more; and my photographs show clearly its extraordinary structure.

I trust that you will reclaim the honour of having first drawn attention to the most remarkable eclipse in history for an Englishman. The Astronomer-Royal, and Mr. Stone, Chief Assistant of the Royal Observatory, and, probably, any working Fellow of the Astronomical Society, can confirm all I have brought forward.—I am, yours faithfully,

J. E. TENNANT, Major R.E.,
In Charge Eclipse Expedition of the
Government of India.

Calcutta, October 16th, 1868.

* Mr. Bovey is mistaken when he says we use his Saxe paper; I did not refer to it.

[It affords us much satisfaction to reclaim for our own countryman the honour of priority in calling attention to the late eclipse, the more so that we recently lamented the absence of perfect success in our photographic operations. This at least balances honours between the two expeditions.—Ed.]

PHOTOGRAPHER'S RELIEF FUND.

DEAR SIR,—I think your correspondent in last week's Journal, although very liberal in offering to subscribe one, two, or more pounds to the proposed Relief Fund, would wish to make it far too exclusive. It should be for those who have met with misfortune, or require assistance, and deserve it; whether or not they had carried on the business of a photographer only, or in conjunction with another, should make but little difference. The more generally a fund of this sort is distributed the more liberally will the world subscribe.

Another of your correspondents suggests a society on the same principles as the Odd Fellows. I should like to know what they are. We have lots of Odd Fellows amongst us, and it might suit us to do as they do; but what are their rules and regulations?—I remain, yours truly,

Southsea, November 16th, 1868. GUM GALLIC AMATEUR.

[The Odd Fellows form a Benefit Society pure and simple, the relation between relief and payment being carefully calculated by an actuary. It forms an organization much too complex, we fear, for the limited number of photographers who would be likely to join it, and would require more time and labour than any individual or committee could give it at present. Besides, those amongst photographers who desire to belong to a benefit society can, if they choose, join the Odd Fellows, or similar body, which admits all trades or professions. So far as we can see, it is to the formation of a Benevolent Fund that attention should be directed at present. We have received a few offers of donations and annual subscriptions in response to our recent appeal; but we expect to receive many more.—Ed.]

PRINTING FORMULÆ.

DEAR SIR,—In an article on "Our Printing Room," in last week's News, Mr. Nelson K. Cherrill gives an account of the methods he employs in preparing, using, and keeping in order the nitrate printing bath. This is a matter to which I have for many years given a very careful attention myself, and on which I have, in times gone by, written in your valuable paper; and having arrived at a conclusion differing considerably from Mr. Cherrill, I beg you to allow me to lay before your readers the points of dissidence, and the reasons therefor.

Mr. Cherrill's bath is thus prepared:—

Nitrate silver	...	...	...	40 grains
Nitrate soda	...	...	...	20 "
Water	...	...	...	1 ounce
Sugar	...	...	...	a little.

Now, sir, if there be any one thing on which practical photographers insist more than any other, it is on knowing what their materials are. Mr. Cherrill admits this when expressing his anxiety to know the strength of his albumen paper; but with the bath he uses he would not apply in any way such knowledge, if he could obtain it. Starting to-day with (say) 100 ounces of this sensitizing bath, you float 20 sheets of paper, and then add 10 grains of silver—in all 200—to keep up the strength. I say, and from practical experience, that you are now at sea completely as to the strength of your bath; any computation as to its strength becomes mere guesswork, and, as Mr. Cherrill himself says, "the relation between the character of the negative and the quality of the paper becomes upset." Of course it does; and as you are completely in the dark as to the strength of the bath, it requires time and experiments before it can be set right.

All this I have gone through with extreme care years ago, and therefore gave up entirely the cause of all this trouble—the nitrate of soda—and came to a good, honest, uncontaminated bath of silver of 70 grains to the ounce, and have been freed from no end of troubles.

I observe certain of our valued friends who write to these pages seem to vie with one another in a rather "high falutin" style; quote freely from the poets, some sacred, some profane, and, generally, indulge in a good deal of imaginary, doubtless

very appropriate, but, as it sometimes strikes me, rather too far fetched. Now, I should like, without anything of that kind, just to show why I abandoned nitrate of soda, and why I found a good many others did.

First. For the reason given above, that you cannot estimate correctly the strength of your bath, as the argentometer cannot be used when other matters are in solution along with the silver.

Secondly. Because the nitrate of soda, being a deliquescent salt, in damp weather larger pictures were not sharp; the expansion and contraction of a 24 by 19 sheet with nitrate of soda sometimes amounted to five-eighths of an inch. We tried putting it out in every conceivable stage of dryness and dampness without avail; as the atmosphere changed, so did the paper.

Thirdly. Because such is the solvent action of nitrate of soda, a good deal of which is washed off after printing in an unaltered state, upon the residuary chloride of silver, that it was found very difficult—almost impossible—to get it to settle down, and the loss of silver was very great in this way, as even when clear, this liquor was, in fact, chloride of silver dissolved in a solution of nitrate of soda. We found, on abandoning nitrate of soda, this source of serious loss disappear at once.

Fourthly. I abandoned nitrate of soda because it was found to be a complete delusion, and entirely worthless for printing purposes. No mortal man could select, from their superiority, prints so done out of a batch, nor could the producer, unless they were intentionally kept in view.

I had, for a length of time, in order to get at the real truth of the matter, a great number of prints done each way, and would try to pick them out when finished; but it was entirely guesswork. I feel sure Mr. Cherrill will perceive that I have no other object in view than the elucidation of truth. The subject is a peculiarly interesting one, and on that ground I must beg both yourself and Mr. Cherrill to pardon my interferences.

SAMUEL FRY.

PORTRAITS ON APPROVAL.

SIR,—I do not endorse the two letters, one by Mr. Downes, the other by Pas-trop, on the subject of taking portraits on approval. I have adopted the plan from the first of my going into the black art, and find it answers perfectly. The public like it, and it gives greater satisfaction to both parties. I get very few returned to me; but if the first sitting is not preferred, I give a second. I find it secures more trade, as the general public like to know what they are going to get for their money. My plan is to make a charge, for the first specimen, of 2s. 6d. (it is paid cheerfully), send the specimen home requesting an answer if more are required in a week's time. I in general get the remaining order in a day or two; if an order for half-a-dozen, my price for which is 5s., the remainder are sent home and the other half-crown paid, and a receipt given. With this plan I get a very good trade without any advertising or puff of any description.—Yours, &c.,

A COUNTRYMAN.

Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The complete success of the exhibition of photographs in Conduit Street is well illustrated by the large number of visitors which have been present. We learn from the attendant of the gallery that not less than five thousand persons have visited the exhibition during the week that it remained open. Two or three considerations are deducible from this: first, that already acknowledged, namely, that the exhibition is a very excellent one, and possesses sufficient interest to secure many visitors; next, that there is no decadence in the public interest in photography as an art; and, hence, that the commercial prospects of photography are not altogether dreary.

PLAIN PAPER PRINTS FROM ALBUMINIZED PAPER.—A correspondent calls our attention to the fact that the plan of printing on the back of albuminized paper is not new, but was proposed many years ago by Mr. Hughes, who mentions it in his *Manual*. We did not mention it as a novelty, but as something old and useful which was not sufficiently generally known, as was evidenced by the frequent enquiries which reached us asking for a simple plain paper process. We have

much pleasure in accrediting the idea to Mr. Hughes, whose prior proposal had escaped our attention.

BRILLIANT PRINTS AND ALBUMINIZED PAPER.—We received from Mr. Bovey, too late for noting in connection with his letter in our last, three albuminized prints intended to illustrate his position that the quality and brilliancy of the print depend much upon the printer, independent of the quality of the paper; and that with the same paper and the same negative, brilliant or flat prints may be produced at will. The three prints are from a good but somewhat soft 10 by 8 negative, and are labelled Nos. 1, 2, and 3. No. 1 is printed on *Saxe* paper, and is somewhat weak and flat; No. 2 is on *Rive* paper, and is vigorous and brilliant; No. 3 is on the *Saxe* paper again, but with a somewhat modified treatment, and is as rich and brilliant as No. 2 on the *Rive* paper, and of as rich and warm a tone. Mr. Bovey sends us another letter this week, in which, referring to Mr. Cherrill's preference for the acetate bath expressed last week, he mentions that it has not always proved certain and trustworthy in Mr. Cherrill's hands, as some months ago it failed, and Mr. Bovey's instructions were adopted to get rid of the difficulty. The failure of a process through accident or error would scarcely furnish an argument of general application, and as a discussion ceases to be instructive when it begins to hinge on individual experiences and involves anything of personal considerations, we think the controversy on albuminized paper had better now terminate.

SENSITIVENESS OF GUM GUAIACUM TO LIGHT.—A correspondent says:—"An alcoholic solution of this gum, spread upon paper, prints green, and as rapidly as bichromate of potash. If, after exposure, the picture is placed in a dilute solution of chloride of gold, it becomes of a brilliant blue, quite equal to cobalt in colour. I know no way of fixing the picture. Salts of gold or silver added to the solution of gum causes a blue precipitate."

To Correspondents.

HENRY WILLIAMS.—A charcoal stove will not be injurious in a studio if it have a proper chimney. 2. Good transparencies may be produced either on dry plates with contact printing, or on wet collodion by camera printing. Our advice as to which was best to employ would be governed by the querist's experience and opportunities. Dry plates, to those skilled in their manipulation, have the advantage of permitting night work. The difference in the quality of the results is, as a rule, that those on dry plates are often most vigorous, and have the warmest tones; those on wet plates generally the most delicacy. 3. For producing transparencies on wet collodion, a well-exposed and not over-intensified negative is best.

H. DIXON.—The glaze on the card you enclose is obtained by the process which has been termed "enamelling," in which a coating of gelatine is attached to the print by means of a coating of gelatine, the fine surface being that of the plate glass upon which the collodion and gelatine are poured as a step in the process. The method was first described in the *PHOTOGRAPHIC NEWS* about eight years ago by Dr. Liesegang, and general attention was revived to it in 1864 and 1865, in which years you will find various communications on the subject in the *News*. On pages 447 and 448 of our Eighth Volume (September 16, 1864), you will find detailed instructions. The print has been returned.

J. H. M.—For the economical printing of photographic reductions of maps we do not think you can use any better process than that of photo-zincography as practised at Southampton, or the analogous process of photo-lithography. The series of articles minutely describing the operations, by Lieut. Waterhouse, which have been given in our present Volume, and an article in our *YEAR-BOOK* for 1867, by Mr. Butler, give the fullest practical information on the subject. We do not know of any one who is practising this process for the public, nor do we know prices.

A. B.—The simplest mode of forming the double chloride of gold and sodium, with the two separate salts, is to mix them in their atomic proportions in a concentrated solution, and then evaporate to dryness; in the course of this evaporation all excess of hydrochloric acid is driven off; the two chlorides combined as a neutral double salt are left. The atomic weight of chloride of gold is 303.5, and that of chloride of sodium 58.5.

LONDONSTONE.—If you prefer a studio with sloping front-light, that designed in your rough sketch seems to be a very good one; but our own predilections are in favour of the ordinary oblong ridge-roof with north aspect. 2. The No. 4D is not suitable for card pictures.

A YOUTH OF FIFTEEN.—Your failure may proceed from a variety

of causes, of which we may suggest some. The appearance of the card numbered 2 suggests under-exposure. It may be that you simply give too little exposure of the deteriorated light of winter; it may be that your bath is getting exhausted and weak; or it may be that your collodion is old and insensitive. If you have not considerably increased your exposures since summer, do so at once; if your bath has been much used, try a new one; if your collodion is old, try a new sample. In any case, much longer exposure in the camera would have improved No. 2; under-exposure begets the tendency to push development, and that induces fog, as it has probably done in your case, which may account for the fog manifestly present in the negative of No. 2. Try again, and let us know the result.

E. JUBA.—For ordinary dry-plate work it is not well to use salts of cadmium entirely in preparing the collodion, unless you are going to keep the collodion some time, as when the collodion so prepared is used new it is apt to be glutinous. In order to prepare any commercial sample of collodion for dry-plate work, the addition of an extra proportion of bromide to the iodizer will generally answer well. Take the collodion you mention, and add to the proportion of iodizer necessary for each ounce of collodion about $\frac{1}{2}$ grain of iodide of cadmium. The papers have been forwarded. We have heard of balsam of tolu having been used as a preservative, but we do not remember details.

T. W. J.—We are not personally familiar with Gray's solution, but presume, from the statement of our correspondent, that it is known amongst house painters. We have used nothing ourselves for cleaning varnished plates which has answered better than a hot, strong solution of common washing soda, which quickly removes the film, after which, friction with woollen cloth and dilute nitric acid is employed; but at best such plates are uncertain. 2. For a strong developer of the double sulphate of iron and ammonia use 50 grains of the salt in an ounce of water and 30 minims of acetic acid. 3. We have no personal knowledge of the lens in question; it is, we believe, pretty good, but not equal to those of the best English makers.

C. T. N.—The annual subscription to the North London Society is 10s. 6d. That amount paid now will entitle you to the presentation prints for the current year, to which we recently referred. The year terminated in March.

J. T.—There are two carbon processes by which half-tone can be produced—Swan's and Poncey's—but both are patented, and the details of the latter are kept secret as well. The sensitive agent in the latter is bitumen, in the former bichromate of potash and gelatine. There is no other carbon process of a practical character, that we know of, by which half-tone can be produced. Fargier's process will render half-tone, but it is scarcely practicable on a commercial scale. For subjects without half-tone there are processes available. Let us know what you require, and we can possibly help you.

GULIELMUS.—You have not sufficiently carefully noted the instructions to which you refer, in which it is stated that 15 grains of carbonate of soda are to be dissolved in water, and part of this added to a bath. When you add carbonate of soda to a solution of nitrate of silver, of course it will effervesce, and will gradually precipitate the whole of the silver as carbonate of silver, leaving nitrate of soda in solution. The yellow precipitate you describe is carbonate of silver. It will gradually redissolve on adding nitric acid; but you will have irrevocably a large amount of nitrate of soda in your bath. In future, when you attempt to neutralize a bath, remember that a very few grains of carbonate of soda can be required. Make a 10-grain solution of the carbonate, and add a few drops at a time; then shake the bottle containing the nitrate solution, and, if it remain clear, add a little more. Cease adding the soda solution as soon as the nitrate solution shows a permanent turbidity, for then all acid is neutralized, and a slight precipitation has commenced. It is quite possible to proceed systematically to rectify a bath and secure certainty of perfect conditions, but you must follow instructions minutely, and not add, at random, 3 drachms of carbonate of soda, when instructions say take part of 15 grains.

JAMES MAYCOCK.—The chief source of crappiness in the film is water in the collodion, too early immersion in the bath, and sometimes dampness from breathing on the plate, or other causes. There is at this season of the year a common risk of immersing the film too soon, as the evaporation of the ether is much less rapid. 2. Sometimes we have known fog arise from excess of alcohol in the developer; but in the circumstances you describe it is probable that the change from gelatino-developer required other changes to prevent fog, as gelatino is a powerful restraining agent. We shall be glad to see the examples you mention. We only know the correspondent you mention by the initials given. It is not necessary that correspondents seeking aid should give their full name.

G. R. GILL.—We will insert your letter in our next. Try floating the paper for a shorter time, so as to leave a little of the salt in the paper unconverted into silver salt; or add a trace of chloride of sodium to the developer.

IGNORAMUS.—Mr. Carey Lea's formula for a solution for cleaning the hands is bichromate of potash 1 part, hydrochloric acid 2 parts, and water 20 parts, and not, as you state it, water 20 ounces. It is clear that when the word parts is used you may make up the preparation in any quantity you like. If you take ounces, you will have 1 ounce of the first, 2 ounces of the second, and 20 ounces of the third. If this quantity, which gives you upwards of a pint, be too much, you can take drachms, which will give you nearly 3 ounces. 2. There is no difference between liquid and solid weight, if parts by weight are stated. The relation between weight and measure in dealing with chemicals may be stated as follows:—A grain in weight is equivalent to a minim by measure; hence a drachm contains 60 grains of a solid or 60 minims of a liquid. An ounce of a solid contains 480 grains, and an ounce of a liquid contains 480 minims.

W. HERBERT.—The photograph has some good qualities. It is a little too red in tone, and the vignette is a little too formal.

OXONIENSIS.—For landscapes solely, nothing can be better than the lens you mark A. Mr. England used for his views in the Tyrol a large variety of lenses, generally travelling with about twenty different lenses, in order to use precisely the length of focus and character of instrument which each subject requires. He uses those chiefly of the first maker you name. We hope he will be induced to record the facts you refer to. 2. Your suggestion as to the cause of the bitterness to which you refer is doubtless correct. The only "elique" we know of consists of three or four disappointed persons, the *disjecta membra* of established journals and societies. Thanks for your kind expressions. The YEAR-BOOK will be ready by the end of the year. We are obliged to defer it until then in order to secure all information necessary for such an annual.

THOMAS STOTHARD.—From the general description of your plan of mounting, we do not see any reason for imperfection in the result, if the manipulation be performed neatly. We will, however, consider your letter carefully, and possibly comment upon it in a future number. 2. You cannot have a good card lens with which a distance of only ten feet would be necessary between lens and sitter; the focus must, in such case, be necessarily too short to do justice to a standing figure. The stereoscopic lens of No. 1 will be as near as any we know.

ONE OF THE EIGHT, referring to a letter on the Photographers' Relief Fund by Mr. Matthews (in which he pointed out that in the town from which he wrote a large number of photographers also practised other professions), charges Mr. Matthews with injuring the profession by low prices. It must be seen at once that questions concerning individuals cannot be discussed in our pages. The broad question of what class of persons should be relieved may be discussed in our pages, but not what individuals. The question of low prices may be discussed and condemned, but not the individuals who charge low prices.

E. HASSELL.—Mr. Trubner, of Paternoster Row, is the London agent for the "Silver Sunbeam."

G. ROBERT FITT.—The splitting of the film in collodio-chloride we have generally found due to the use of a too horny and contractile collodion, and the same cause tends to the production of irregular and patchy toning, the aqueous solutions not readily permeating the repellent film. Keeping for some time, with excess of free nitrate, has a tendency to produce the conditions which cause the film to split. The sulphocyanide tints are pleasant. The lighting relieved by reflecting screens is very effective. Thanks.

W. J. A. G.—Mr. England this year chiefly used the wet process, because he did not find the dry process work to his satisfaction when the plates were prepared by an assistant. The card you enclose is very good indeed. You will be fortunate in obtaining an introduction to and information from the amateur you name; he is a very courteous gentleman, and one of the ablest photographers we know. If you will send us an addressed envelope we have a communication for you respecting your Liverpool plates.

T. GULLIVER.—Many thanks. We will write shortly.

H. KELSALL.—Many thanks.

A. W. HOSMER.—We duly received your offer. Thanks.

W. H. PULLEN.—Received. Thanks.

Several Correspondents in our next.

Photographs Registered.

Mr. T. KIRKBY, Trentham.

Two Photographs of Mr. G. Peake.

Mr. D. PHILLIPS, Aberdeen.

Photograph of Right Hon. H. A. Bruce, M.P.

Mr. THOS. MILLER, Wellingboro'.

Photograph of Right Hon. G. W. Hunt.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Fogging of Developed Prints.—New Remedy.....	565
Amateur Criticism.....	566
Posing, Phrenologically and Psychologically Considered. By John Beattie	567
Rapid Development Printing Process. By J. W. Waterhouse	568
Experiments, Intentional and Otherwise. By Ed. Seeley.....	569
Photography in Upper Egypt. By Dr. Vogel	570
Pictorial Effect In Photography. By H. P. Robinson.....	571
On a New Series of Chemical Reactions Produced by Light. By John Tyndall, LL.D. F.R.S., etc.	571

	PAGE
Micro-photography. By M. Jules Girard	572
On the Formation of Peroxide of Silver by Ozone. By M. F. Wochler.....	572
Correspondence—Photographers' Relief Fund—Amateur Criticism—Proportion of Salt in Albuminized Paper—Paper turning Brown on Development—Mr. Bovey's Method of Toning—Portraits upon Graves—Printing Formula.....	572
Talk in the Studio	575
To Correspondents.....	576

FOGGING OF DEVELOPED PRINTS.—NEW REMEDY.

WE have recently been engaged in some experiments for the prevention of fog, or the general browning of the paper during the process of printing by development, and, so far as we can at present judge, the remedy we propose promises the highest success. The fogging of paper prints during development is by no means uncommon. On another page we print a letter which describes this difficulty in a form not unfrequent, we believe, with beginners in this mode of printing; the example accompanying the letter being one of a class which often reaches us, with anxious enquiries for a remedy. The print, instead of possessing pure lights and deep shadows of brown or black, possesses dull-grey whites and weak-brown shades, whilst by transmitted light the whole presents a mottled-brown effect. The silver salt, in short, instead of being reduced in the exact ratio of the action of light in forming the image, is reduced in some degree throughout the whole of the paper, and a dirty, foggy, imperfect picture is the result.

Before proceeding to speak of our experiments, we mention two or three of the most common causes to which this defect may be referred. One of the most frequent is the action of diffused light. It is difficult to bring the novice who has been accustomed to the ordinary process of printing fully out, in which the action on the paper of a feeble light is not regarded, to believe that in printing by development, light should be as carefully excluded from the prepared paper as from an excited collodion plate. And hence a little white light being permitted to reach the paper at some stage of the operations, degraded whites or general reduction is the result. It is probable that the correspondent to whose letter we have referred, who is an experienced and ingenious photographer, would scarcely neglect proper precautions in this respect, and, indeed, an example of good results, obtained by the same formula as the failure, suggests that no white light had been permitted to enter the dark room in its production.

But there are two or three causes to which the defect in question may be due. In the first place, the formula employed, whilst it is one which will doubtless give great sensitiveness, is one which will also very readily give fog the moment any of the conditions necessary to success cease to be present in the precise form. His paper is prepared with a salting solution containing about 17 grains of iodide of potassium, and under 6 grains of bromide of potassium in an ounce of water, and excited on a 60-grain nitrate bath. There is no acid in either the salting or exciting bath. Compare this with a formula recently given in our pages, described as giving very rapid and excellent results. In the latter formula we find the salting

bath contained about $4\frac{1}{2}$ grains of iodide of potassium and 18 grains of chloride of potassium, together with 7 or 8 drops of lemon-juice and 9 grains of tapioca, in an ounce of water; whilst the silver bath, which is a little weaker than our correspondent's, also contains about 5 grains of citric acid to each ounce. In the latter formula everything tends to lessen the chances of fog or abnormal reduction—the decreased quantity of iodide, the large proportion of chloride, and the free use of citric acid. The comparison of the two formulae will be so suggestive to all working in this direction that we need not enter into lengthened comment on the matter.

Another cause of this fog, or abnormal reduction, arises from the paper being kept after it is excited. It is always desirable that paper should be exposed and developed as soon after exciting as possible. Most printers are familiar with the fact that in any kind of excited paper which is long kept there is a tendency to decomposition in the compound formed between silver and the size of the paper, and if this decomposition be only incipient, it will inevitably be completed in the process of development.

Another cause of discoloured lights, and a general dirty yellow, mottled effect being produced throughout the print, is imperfect fixation. Either from carelessness, or with a view to improve the tone, some photographers place the developed print in the hypo at once, either with very little washing, or none at all. If the hypo be weak or old, the paper, saturated with nitrate of silver and gallic acid, causes a decomposition in the hypo, which sulphurizes the print, or, worse still, leaves it with undissolved hyposulphite of silver in the body of the paper, which, decomposing, produces the dirty yellow, mottled effect familiar to some who have failed in enlarging by development printing.

The remedy for some of the defects we have mentioned is obvious enough: it is simply to avoid the causes we have indicated as operative in producing the defects. There is a remedy for the fog caused by neutral and excessively sensitive conditions, which, in relation to development printing, has never, we believe, been suggested, but which, from recent experiments, we have reason to think will be very effectual, and will especially meet the case of the correspondent whose letter appears on another page. His especial difficulty is that the same conditions which at times give him perfect prints, at other times—without, so far as he knows, any change in causes—yield only fogged prints. We have repeated the experiment, and have been able to produce at will, without any change in the materials used, either clean prints, or prints utterly fogged, and have traced the cause and remedy.

The cleanness or fogging depends on the presence or absence of an unconverted haloid salt in the paper. If the paper be floated sufficiently long on the silver bath to convert the whole of the iodide or bromide into silver salts, the

tendency will be towards fog; and where excess of iodide and little bromide or chloride is used, the complete conversion is much the most readily effected. If the floating be short, and especially if a full proportion of bromide be present, a portion of it is not converted into a silver salt, and its presence during development operates as a powerful preventive of fog in the print.

We have tried adding a trace of bromide or chloride to the gallic acid used for development, and find it a most effectual preventive of fog; but if used in excess, it will very seriously retard development, and will also tend to the production of a print wanting in force and richness. It must be used, therefore, with great caution. Our experiments have not been sufficiently extensive to enable us to decide on the best formula or proportions; but that is a matter which will be easily decided by the experimentalist himself, the more so that the exact proportion required will doubtless vary with circumstances. Let it be understood here that the novelty of the remedy consists in the application to development printing on paper of a principle already found of value in dry-plate photography, and first suggested in regard to dry plates, if we remember aright, by the late Mr. Glover. The presence of a free bromide in securing immunity from fog in dry plates is undoubted; and our experiments suggest an equal advantage in its presence, or that of a chloride, during development of paper prints.

AMATEUR CRITICISM.

THE letter of a correspondent on another page, protesting against "amateur and anonymous criticism," suggests the necessity of a few brief remarks on the subject generally. Criticism of pictures affects and interests in relative degrees three classes of persons: the exhibitors, whom it may gratify or displease, and, possibly, instruct; that portion of the public who, having the opportunity of seeing the pictures criticised, are led to examine, compare, and exercise their judgment, and who, whether they endorse or condemn the criticism, and whether they are instructed or not by the remarks in the criticism, are benefited by the exercise of the analytical faculty induced; and the general readers, who, having no opportunity of examining the pictures criticised, nevertheless have two sources of interest in the subject; first, in the information they derive as to the character and degree of the progress which is going on in the photographic world at large, with which they have little opportunity of coming into direct contact; and, second, the instruction they derive from a description of faults to be avoided, or of beauties to be aimed at.

It is desirable that each of these classes should be considered in a criticism, and, if possible, satisfied; but it may be affirmed—and the statement should not be regarded as disrespectful or offensive—that the first class mentioned should be the last and least considered by the critic. It is the second and third class, comprising the public at large, for whom a criticism should be especially written. It is desirable for each that the criticism should be discriminating and able; it is imperative for all that it should be honest. All criticism must, it is scarcely necessary to observe, be but the expression of an individual opinion, and must, therefore, necessarily derive part of its value from the authority which attaches to the judgment and honesty of the writer. If it bear a well-known and trusted name, or if it have the editorial sanction of a journal of repute, it possesses more weight, and its instruction is of more value, than can possibly attach to the dictum of an anonymous writer, or that of a journal of no character.

But in a certain sense, and in some degree, all criticism, anonymous or otherwise, written with a fair degree of ability, and not absolutely tedious or intolerably ignorant, possesses its value, especially to the last and largest of the classes we have named. To them, without the means of testing the precise accuracy of the writer's judgment by an examination

of the pictures commented on, the discussion of qualities in pictures possesses the value of iterated instruction. If the writer attach value to artistic qualities—his criticism dwelling, as he passes picture after picture under review, on various forms of pictorial beauty, praising this for its perfect composition, that for its expression, another for the rare feeling of space and atmosphere, and a fourth for the massive grandeur of its light and shade; or blaming others for awkward lines, spottiness, hardness, and want of transparency, or general feebleness—the mere reading of his criticism, if it be written with any ability, is instructive, as it impresses the student with an increased interest in qualities to be sought, and defects to be avoided. If the critic have a technical mind he will dwell on definition, cleanness, fine tones, pure lights, &c., as virtues; or on slovenliness, fog, stains, bad definition, distortion, &c., as abominations. This in its degree may be instructive; and in all this the instruction will be in some measure irrespective of the precise aptness of the writer's judgment, or the exactitude of the relation of his remarks to pictures which the reader cannot see or compare.

In thus examining the function of criticism, let us refer to the letter of the correspondent above mentioned, who protests against "amateur and anonymous criticism;" and in doing this we must again digress a moment to refer to the varied degrees of editorial responsibility in relation to communications which appear in a journal. This responsibility possesses three degrees. For editorial articles the conductor of a journal is absolutely responsible; whether he is dealing with facts or principles, theory or practice, he is solely answerable for the good faith and capacity involved in such articles. For the character of articles bearing the name of the writer he is responsible in a less degree, the facts and arguments resting generally on the authority of the contributor, the editor being chiefly concerned to avoid the appearance of violations of known facts, and of unimportant or offensive matter. For a third class of contributions, which at times forms a feature of considerable interest in photographic journals, the editor is still less responsible: we refer to letters addressed to the editor, which appear under the general head of "correspondence." For the facts, opinions, or ability embodied in such letters the editor is avowedly not responsible. He is simply concerned to see that they are not unfair, that they do not violate good taste, and, if they contain statements of fact affecting injuriously the interests or feelings of individuals, that they should be substantiated by the name of the writer.

Having briefly stated these conditions, we return to the letter of "Lux in Tenebras." In reply to his suggestion of a doubt as to the propriety of giving insertion to the amateur criticism of an anonymous correspondent, we might briefly answer that we did so because we believed it would be interesting to a large number of our readers; but it is worth while to make a few further remarks. Besides the interest of comments on pictures illustrating progress from a different and, possibly, opposite point of view to our own, we should state that the gentleman who chooses to be known to photographers as "Lux Graphicus" possesses in many respects eminent qualifications for presenting an interesting sketch of such an exhibition. He is an old photographer, and a still older art-student, as well as a shrewd observer, possessing facile and graceful expression; and we know that his letters are read with interest, and in most points we cordially coincide with his views. That we need not do so in all we have already shown, and we may at once frankly admit that in some of the points to which "Lux in Tenebras" refers our judgment is distinctly opposed to that of "Lux Graphicus."

In the first case cited, that of a group by Messrs. Robinson and Cherrill, mentioned by the latter correspondent as "too suggestive of scissers and paste," it appears to us that a knowledge that such a picture must of necessity have been produced by combination printing has unconsciously suggested the criticism, for it strikes us as in all respects

singularly free, in its art qualities, from the most distant suggestion of such a mode of production, and as being in reality one of the noblest works of its class we have seen. The landscape background is a perfect picture in itself, full of light, space, and atmosphere. Three fine children, and manifestly charming portraits, admirably grouped, and composing most harmoniously with the landscape, occupy the foreground, and complete a picture full of life and interest. We see not only no mechanical joins, but no suggestion of piecemeal work; and a pervading sense of unity and harmony, which indicates that the artist conceived the work in its wholeness, mechanical exigencies being entirely subservient to the conception.

We might in like manner take exception to the sweeping remarks on Mr. Fry's pictures, in which, as our correspondent suggests, the temptation to make a joke perhaps gave rise to exaggeration. Mr. Fry's contribution contained pictures of varied qualities, some illustrating the extremest contrasts, others the greatest softness possible without dinginess. It is probable that these gradations in style were specifically intended as experimental effects, something in the fashion in which the Laureate some time ago gave the literary world his experiments, in the *Cornhill Magazine*, in varied metres.

The remarks of "Lux Graphicus" on Mr. Blanchard's pictures, to which our protesting correspondent takes some exception, we, on the contrary, thoroughly endorse; nothing could well be finer than the majority of his contributions.

As to the question on the amount of retouching on M. Salomon's pictures, it is not worth while to revive the discussion. That some of them have a good deal of retouching no one, we believe, denies; and it is not worth while to dispute about the term "elaborate." That the finest of them are not retouched in any degree worth mentioning, if at all, all who have had the best means of enquiry and examination are thoroughly satisfied.

That different opinions must prevail on all questions of art criticism, even as to perception of matters of fact, is a manifest necessity, for it should always be remembered that "the eye only sees that it brings with it the power to see."

POSING, PHRENOLOGICALLY AND PSYCHOLOGICALLY CONSIDERED.

BY JOHN BEATTIE.

This paper may, at first sight, seem somewhat out of place in the *Photographic News*, and my way of treating it faintly, yet I think the subject worthy of a little thought.

Whatever theory of mind we adopt, whether that of special creation, that of evolution, or development, this much is true—there is, and must be, more than the mere momenta or assumed forces bound up in the molecules forming the first principles of organic life. In spite of the brilliant talent now employed, and, to a great extent, successfully so, to prove that in matter there slumber forces adequate to the production of the higher organisms, and, therefore, of man, to the incisive mind the reasoning employed seems inconclusive. I say it matters not whether the completed organism is the educt from, or product of, a germ. We cannot conceive of a part being the effect of a pre-existing part, and that in its turn the cause of other parts, the completed product being man. We cannot conceive, I say, such a result possible from all the apparently subtle and combined phenomena of matter; nor is it necessary to go out of the organism for the formative force, for that would be what Mr. Lewis would call a theological idea. Philosophers have a great objection to a creative intelligence. There seems to me to be clearly set forth this principle, that the active forces revealed to us, and called physical forces, are the result of disturbance in subtle substances that defy all analysis; when they are at rest, we have no intimation of their existence; yet these are subject to, and pliant in, the

hands of a higher force, which I call *spiritual*; they are not transmutable, the one substance active, the other passive; the one moral, the other material; one conscious, the other unconscious.

The spiritual organic being, therefore, that permeates and circulates through every part of the physical organism is the conscious man. And as the spiritual organism unfolds itself, whether by evolution or otherwise, so does the physical organism. There will not be one secret or sleeping force in the spiritual germ that will not awake and clothe itself in material covering in *form and arrangement* exactly in harmony with all the tendencies of the inner and conscious being. That this is so, all who care to think will admit; it is but the formative law in action. Base affections are always clothed with vicious forms: see the principles in the various animals. Here I must refrain from details.

The complicated phenomena of perception clearly proves that all appearances are but the outgrowth of mind. We have nearly all physical eyes, but to what a limited extent do most of us see! It was said, "He that hath ears to ear, let him ear;" and it might likewise have been said, "He that hath eyes to see, let him see." How difficult it is to see the immense depth of this philosophy! To see into things is the function of the spiritual eye; to see that external forms are outbirths of internal qualities or affections; to see that the whole outward anatomy or mechanism of man is a perfect index to the true or spiritual man; to see that not only are the sum total of exquisite mouldings in the human face, but the whole osseous and muscular structure of the body, indicative of character, from the strong to the weak, from the intelligent to the imbecile, and from the pure to the sensual and base. In a word, before we can give character in portraiture, we must understand those fine appearances upon which such character depends. All this will depend upon our faculty of seeing; and our faculty for seeing depends upon our true spiritual idiosyncrasy.

There can be seen so much of the artist in every work he produces. For instance, one artist may have a keen perception of colour and beauty of form, but a feebler perception of moral and religious beauty; another may have both. Portraits of some of our eminent men by such artists would differ much. Take, for instance, Mr. Bright, with his brilliant intellect, his lofty moral nature, and his impetuous emotions. The former artist would look at his fine physique, place him with the chin prominent, exhibiting the heavy jaw, and, to some extent, the fish-shaped mouth, with a long, though sensitive top lip, and, throwing back the splendid intellectual part, giving secondary effect to the keen eye, thus bringing out in the portrait, with undue prominence, the lowest qualities of his nature. The latter of the two would study the head carefully, and so place it that the lower parts of this face, representing the emotional part of his nature, should be in due abeyance, and the parts representing the noblest part of the man brought most forward; thus not only a likeness, but a portrait in the highest sense, would be the result.

To illustrate my idea further, I could send you, from my own city, portraits of men who, if you once met, you would see by their fine, symmetrical heads and faces, that they were men of many and noble parts. But look at their photographs. True, you will know them, not because they are portraits, for were you to judge of the man by the picture, every fine point is so ignorantly concealed by the pose of the head that you would surely take the photographer for a fool.

I fear I am going to ask you for too much space, but I must have a few words more upon the pose of the figure from the same standpoint.

How often do we see the limbs of a male figure like props to keep the figure up, instead of parts under the control of a graceful mind! Again, in the lady figure there are parts, when badly draped, and unduly prominent, indicate gross vulgarity of taste on the part of the artist. Suppose a lady with the strongest balance of face under the eyes, the upper

lip long, the nose somewhat of a pug, luxuriant hair, with rather a good figure, richly attired in wedding costume, placed as I saw one the other day, sitting with full front face, head well back, the stomach all exposed, one arm on a table, the other thrown away on the skirt of the dress, the face saying—Now look at me!—the effect to the cultured eye one so common-place that you could only conceive it to be the work of a "commercial," and not an artistic, photographer.

I must refrain from further illustrations, and simply say, that as photographic portraiture has passed through all the lower phases of development, its professors must, to succeed, be men versed in all the relations mind holds to matter and form; they must see clearly that form is a product of mind, and not the converse, and thus be able to give prominence to all the fine points of form and figure, the result being, in all cases, true portraits, in both a mental and physical sense. Look at the sublime ruggedness of Carlisle's head, the picturesqueness of Longfellow's and Tennyson's, the fine symmetry of Mill's, the angularity of Gladstone's. In all cases the soul and form are harmonious.

RAPID DEVELOPMENT PRINTING PROCESS.

USED FOR MULTIPLYING MAPS IN THE BELGIAN WAR OFFICE.

BY J. W. WATERHOUSE.

I SEE a query, in this week's News, from a correspondent, J. H. M., who asks for an economical method of printing photographic reductions of maps. He may possibly find the following process more convenient to practise than photolithography, while it is much more economical than the ordinary silver printing processes, and has the advantage of being worked with great rapidity. It is extensively used in the Belgian War Office, and answers the purpose exceedingly well, the prints produced being very clean, and of a good black colour. The details are as follows:—

Thin Steinbach Saxe paper is salted by floating it for one minute on a solution composed of—

Chloride of ammonium	...	...	2 parts
Citrate of soda	...	...	2 "
Water	...	...	100 "

Sufficient citric acid should be added to make the solution just acid. The paper is then dried, and may be kept for use.

To sensitize it, float for three minutes on a bath containing four or five per cent. of nitrate of silver rendered acid with citric acid. This operation and the drying must be performed in a perfectly non-actinic light, as the paper is very sensitive.

The exposure under the negative varies from a few seconds to one or two minutes, according to circumstances.

When the prints are ready, they are developed as follows:—

Prepare stock solutions of—

A.—Acetate of lead	...	...	1 part
Water	...	...	100 parts
B.—Gallic acid	...	...	1 part
Alcohol	...	...	8 parts

To 4,000 parts of water, 50 parts of solution A and 8 parts of solution B are added (if the weather is warm, or the prints have been over-exposed, a little acetic acid may be added with advantage), and the mixture is filtered into a large dish. The prints are immersed one by one, and constantly moved about, to ensure the even action of the solution. The detail gradually strengthens, and, after about a quarter of an hour, appears of a good black colour. They are then removed to a bath of hyposulphite of soda at 30 per cent., and remain in it with constant movement for ten minutes or a quarter of an hour, and are then well washed with several changes of water. No toning is necessary, but, if required, the prints can be toned in the ordinary way;

but in that case they must be well washed after removed from the gallic acid bath.

I may also draw your correspondent's attention to two other processes which give very good results, and are, at the same time, economical and rapid, with the extra advantage of producing permanent prints.

The first of these is the original carbon process of adding some indiana ink or other fine black pigment to a mixture of bichromate of potash and gelatine, and coating paper with it. After exposure to light, the prints are washed in tepid water till the unaltered gelatine is removed. This process is very simple, and gives very good results for copies of maps or line work.

The second is somewhat similar, and consists in coating thick Saxe or Rive paper with the mixture of gelatine and bichromate of potash recommended for photozincography, exposing to light in the same way; but, instead of inking with soft transfer ink, the prints are inked, after exposure, with hard printer's ink, to which a small quantity of dryers may be added. The prints are then washed with warm water in the same way as photozincographic transfers, and dried. The advantage of the last method is, that the progress of printing can be seen, which is not the case in the first process, though, with a little experience, the duration of the exposure is readily guessed. It is, however, chiefly applicable in cases where the small number of prints required will not justify the extra trouble of transferring to stone or zinc. When successful, the prints are very clean, and infinitely sharper than photolithographs. I have also seen some very passable prints in half-tones produced by this process on rough drawing-paper.

40, Hamilton Terrace, N.W., November 21st, 1868.

EXPERIMENTS, INTENTIONAL AND OTHERWISE.

BY ED. SEELEY.

PERMANGANATE IN THE BATH PRECIPITATING IODIDE.

WHEN permanganate of potash is used to clear a silver bath of organic matter, it appears to precipitate the iodide as well. Perhaps it would do so perfectly if excess were used.

"ANOTHER GUY!"

I have used both glycerine and treacle to preserve negatives in a moist condition. With glycerine there is a tendency to slight fog, but none at all with treacle. Once, when at work in the dark-room, I was startled by a loud explosion, and found a bottle had been blown to minute pieces. To my astonishment, I found it was one I had used a week or ten days previously for dilute golden syrup (about two-thirds water). The bottle had been left nearly half full, and, I suppose, fermented. It might have been awkward. "From my example warning take!"

SUN-PRINTING IN THE SHADE.

As sunshine is rather scarce now, a plan which will enable unlucky photographers who have harsh negatives to get the same softness in the shade as they could in the sun may be to some extent useful. It is very simple, consisting only in placing next the paper a pad of cloth, dried more or less according to the degree of softness required. My attention was drawn to it some time since by finding some very flat, poor prints among a batch otherwise very satisfactory. This continued for a few days. Naturally, as Mr. Bovey says, I blamed the paper, for I *knew* (not guessed) that the chemicals were right. But careful observation showed that good and bad prints were sometimes produced from the same sheet. So the paper was out of the question.

I then found that the printers, finding some of the cloth pads used in printing were damp (after wet weather), had dried them. So we put out several pictures with pads dried in different degrees. They came in softened in corresponding ratio. One was brought in with this remark, "Please, sir, this won't go any darker; it hasn't gone on at all the last hour or so!" In this case both paper and pad had been put in quite dry and warm. The lights were printed through,

while the deepest shades were hardly more than middle tints, and the whole horribly mealy.

For still further proof a picture was printed with a dried pad behind one half, and an ordinary one behind the other. The proof was complete!

Though this plan may with care be sometimes useful in producing passable prints from negatives otherwise too harsh, it must be remembered that not only is it very easy to spoil them quite, but that, at the best, the softness is of the character of mealiness to some extent. So, when circumstances admit of a better plan, do not use this. It is not, however, to recommend its use that I mention this, but because I think it explains a frequent cause of failure.

Many writers advise drying the paper *thoroughly*; and in dry weather the pads will also get rather dry; then the printing is bad, and both paper and toning bath are blamed, when perhaps neither are in fault.

Possibly it may help to throw light on other subjects, as: the difference in the time required in printing on paper, and with collodio-chloride on glass; and also why organic matter is necessary with collodio-chloride and with negative dry processes.

Since making the above experiments, the subject has been slightly referred to in the *News* as a cause of failure.

FOG v. MIST.

Some time since nitrate of baryta was recommended as an occasional cure for foggy baths. I tried it with an old one, at first with apparently little advantage; so, as excess was said to do no harm beyond increasing density, I gave it a good dose. "A perfect cure," I thought, while the negative was under the iron; but when I looked through it the density was unmistakable; it was all like ground glass; and when the film was removed, a white ghost of the picture remained on the glass! A little reflection explained it. A mixture of nit. baryta and sulph. iron instantly gives sulph. baryta. So much for taking advice without thinking!

PHOTOGRAPHY IN UPPER EGYPT.

BY DR. VOGEL.

WE are now arrived at Denderah, fifty miles from Cairo, the second station on our photographic journey. The roof of the temple of Hathor is our lodging, the quarter for night being established in a chamber without roof—I could almost say without walls. The temple beneath is a horrible chaos, once a wonderful piece of work covered with sculpture, paintings, and gold. It is now destroyed by the tooth of time, half-buried by dust, offering a shelter to masses of flittermice, extinguishing with their wings the candle of the harmless traveller, grazing his face, and infecting the vaults by their stench. Every now and then a lizard is gliding along the blackened walls, uttering, in the evening hours, a peculiar smacking noise, and called, therefore, the Egyptian nightingale. For variety's sake, a scorpion joins them, and we cannot therefore be astonished that the Arabians are afraid of these horrible rooms during night, and assert that abode within them after the day is past brings death.

Our adventures in this place began with a misfortune: when the Arabians transported our effects on the roof of the temple, one of them fell in one of the apertures which afford the only light to the inner rooms of the temple. It was in the night; we therefore descended with lanterns, and found him with his arm twice broken; but, happily, alive. One of the company, Dr. Fritsche, instantly applied a provisional bandage, and the following day we transported him to the hospital of Kennec. Nor were we ourselves spared the evils which generally reach all who travel in Egypt. One victim is covered by pustules (Egyptian boils), which prevent him from sitting and lying; another suffers of a cramp in the stomach; whilst a third suffers from ophthalmia. I myself have been spared the sufferings, but, in compensation for this, I have undergone several photographic troubles, which make working very difficult. Our provision of twenty

quarts of distilled water from Berlin had been almost entirely spent at Aden. At Cairo we had procured a new stock at the rate of tenpence for a litre.

The very exterior of this *aqua purissima* discouraged us, a slight milky-tint arousing the suspicion that it had been distilled on the same apparatus which had been employed for distilling etheric oils, without any previous rinsing. Much more suspicious, however, was its behaviour in presence of silver salt. In a very short time a bath prepared with this water became brown; after every plate it became more insensible. Sunning was of no use; after having been placed in direct Egyptian sunlight, which is very intense, for twenty-four hours, the brown colour had been changed into a blue one.

Equally fatal was the influence of this water on an old bath which I had intensified by a solution of silver in the before-mentioned water. At 18° K. (72° F.), crystals of iodide of silver were precipitated in masses, and from this moment it became insensitive, and afforded plates with pinholes. Filtering and cooling (ice cannot be purchased here) was of some use; but as soon as the heat increased the same (fuld) fault again arose, and from eleven o'clock the bath could not be used the whole day. At last I took refuge in use of the old bath at Aden, put aside because it gave spotty plates. The organic substances in it were destroyed by permanganate of potash, and now the bath works admirably. After this happy cure I very successfully treated the second bath with the same permanganate, and I may warmly recommend this remedy to every photographer.

The fabulously dryness threatened our materials, constructed of too fresh a wood. First of all our tripod-stand became full of fissures; afterwards the framework of my camera inclined to part.* The first was tolerably repaired, the other smeared out with wax. In order to secure the other camera we kept it wet day and night.

Our photographic operations often began by retouching the originals, being often obliged to scrape the dirt from the walls in order to make visible the hieroglyphics. Other difficulties—as, for instance, the gases produced by the dirt of the flittermice, which caused many evils, especially with long exposures; the north wind perpetually blowing, which often made exposures in open air impossible.

Mr. Bedford is known to be a very excellent landscape photographer, and his productions highly appreciated. I felt a little disappointed when I first saw his Egyptian pictures immediately before my departure. These prints were not equal to his other productions. Now I am no more astonished at this circumstance.

In spite of all these difficulties, we have been pretty successful, securing at Denderah alone about fifty negatives, a result by which we may be satisfied. We are now working in the inner of the temple, making visible the dark corners by *sunlight*, reflected to them by mirrors; magnesium light is only to be made use of if the flame can be situated quite near the object. If the light be removed further than 25' it is of no effect. On such occasions we have often burnt six grammes of magnesium wire without success. On the short distances of Sakara the magnesium light was much more useful.

Most of the reliefs and walls were taken with Steinheil's aplanatic lens, which works admirably, in consequence of its flat field and great aperture.

But now I must conclude. It is late in the evening, and my "fanous" (lantern) is nearly extinguished. Our Arabian guard, two men armed with guns with matchlocks, is just arriving in order to protect us. The rumour, however, goes, that these fellows alone would not have courage enough to sleep on the temple, so much are they afraid of the Afrit (ghost) residing in the temple. When Dr. Dumichen, the Egyptologist, had taken quarter in the Temple of Edfu, the inhabitants of the village made complaints to the "schech" (mayor) that he had driven out

* The camera was a very excellent one, by an English maker, constructed after the idea of Mr. Wharton Simpson.

the Afrit, who was now haunting the village. The schech endeavoured to induce Dr. Dumichen to leave his quarter in the temple. But Dumichen did not go. Now the inhabitants made complaints to the "mudir" (sheriff), who decided that whoever would be tormented by the Afrit should come to him; he would give him a hundred lashes. From this moment nobody ever complained of the Afrit.

With blows you get farther than with love; and for my own part, especially, as I do not know enough of the Arabian tongue, I was forced to purchase a whip of hippopotamus skin. This instrument and the revolver form a very important part of my travelling equipage.

Denderah, September 26th, 1868.

PICTORIAL EFFECT IN PHOTOGRAPHY;
BEING LESSONS IN
COMPOSITION AND CHIAROSCURO FOR PHOTOGRAPHERS.
BY H. P. ROBINSON.

CHAPTER XLIII., AND LAST.

"I trust these lessons will have served to dissipate the idea that to acquire art to a useful and gratifying extent, a genius is needed; that they have proved a knowledge of it to be the result of education; and that art may be possessed by all in a valuable degree, if it can only be attained by few in a remarkable degree."—J. D. HARDING.

My task is done. Beginning with the simplest elements of composition, but avoiding all learned preliminary disquisitions on the theory, quality, or moral signification of geometrical forms, with which some writers occasionally risk confusing their readers at the commencement of works of this kind, but which are not useful, I think, to the photographer, I have led the student through the mazes of this often complicated subject, using the simplest language I could command, and often preferring to state a great principle more than once rather than it should not be made perfectly plain to the reader, preferring plain, unvarnished statements to the wonderful flights of fancy by which art has been sometimes made to look so formidable to the photographer. I have endeavoured to keep the subject clear of those "awe-inspiring mysteries" with which those who have nothing practical to teach have endeavoured to surround it. There is often as much art in knowing where to stop as in proceeding in a proper manner; and I have especially endeavoured to avoid teaching too much—that is, leading the photographer further into the depths of the subject than his art can follow; as I said in my first chapter, I have endeavoured to show how the body is constructed, leaving the soul to others. Babies thrive better on milk than on curacao, and I have been writing for the youngest student in art. One of the easiest modes of escaping from the difficulties of analysis and the perils of explanation is to go off into fits of wonder, and talk mysteriously of mystery. The fear of being thought shallow has not deterred me from being clear; I have not tried to appear profound because I was unable to fathom my own ideas; and I have avoided, as much as possible, technical language, which is often the refuge of obscurity, and the pompous sham which is often required to be taken for depth.

Sir Joshua Reynolds, in his last discourse, says, "I am convinced that one short essay, written by a painter, will contribute more to advance the theory of our art than a thousand such volumes as we sometimes see; the purpose of which appears to be rather to display the refinement of the author's own conceptions of impossible practice than to convey useful knowledge or instruction of any kind whatever. An artist knows what is and what is not within the province of his art to perform, and is not likely to be forever teasing the poor student with the beauties of mixed passions, or to perplex him with an imaginary union of excellences incompatible with each other." It was with this sentence in my mind that I commenced this series of papers. Without much previous practice in writing a sustained series of papers, I relied on my knowledge of the subject for success—knowledge of the few simple but immutable

laws of art which I had learnt as a painter, and found of immense value in my practice as a photographer. Thus much for the matter. For the manner I must claim indulgence. I have written as I should have spoken to a pupil, not for the purpose of displaying eloquence, but with the intention of teaching art. What I have written I have practised; and what I have practised I have written. In these articles, to quote Sir Joshua again, "I have, in no part of them, lent my assistance to foster new-hatched, unfledged opinions, or endeavoured to support paradoxes, however tempting may have been their novelty, or however ingenious I might, for a minute, fancy them to be; nor shall I, I hope, anywhere be found to have imposed on the minds of young students declamations for argument, a smooth period for a sound precept. I have pursued a plain and honest method, and I have taken up the art simply as I found it exemplified in the practice of the most approved painters."

So much of myself and my intentions. Now, again, a few more words to the student, and for the last time. There is something more in art than what I have endeavoured to teach; something more than composition, chiaroscuro, and pictorial effect. Composition may be called the skeleton of a picture, and chiaroscuro the flesh in which that skeleton is clothed; but there is something beyond this. As the living body has a living soul, so has art; something that the French try to express by the term "*Je ne sais quoi*;" that indefinite something about which those who know least write most, because it is indefinite and intangible, and about which the ignorant world take rhapsody for knowledge. Who can penetrate into the dim regions of the unknown, teach the unteachable? Who can describe and reduce to lessons the "know not what?" Yet, without this indefinite, intangible, hidden, unknown soul, a picture is but a scientific performance, and gives no more idea of nature than does a rag doll represent the life. "So, then," it may be said, "art comes by inspiration—comes by second nature." In its highest phases it perhaps does; but nevertheless, it comes by laws that it is possible to note, and which it is possible to teach. Those laws govern the forms which art takes, and a knowledge of these laws prepares the student for the higher inspiration.

It has been said, "The poet's born, not made;" but Ben Jonson, with a higher and wider truth, and on an occasion when the first proposition may have been held to be true in a very eminent degree, in his address "To the memory of my beloved Mr. William Shakespeare," said,—

"For though the poet's matter Nature be,
His *Art* doth give the fashion. And, that he,
Who casts to write a living line, must sweat,
(Such as thine are) and strike the second heat
Upon the muse's anvil: turn the same,
(And himself with it) that he thinks to frame;
Or for the laurel he may gain a scorn,
For a good poet's made as well as born."

And so it is with the artist. Innate taste is not sufficient to make a painter or a photographer. As a poet has to learn the grammar of the language in which he writes, so must the artist learn the principles on which his work is based. If the student trusts to that vague thing called taste, he trusts to a broken reed; let him rather endeavour to acquire that more certain and profitable culture which comes from study and practice.

In conclusion, I cannot do better than impress upon my reader the absolute necessity, if he wishes to become an artist, of incessant application, not only to study, but to the production of the results of study—pictures. To call yourself an artist before you have produced a picture is but to give yourself an empty name. To be an artist it is necessary to do something more than take an occasional bad landscape or portrait in photography, or to paint a poor background, spoil a photograph with colour, or make crude sketches with the brush. Nothing beyond this can be done without hard work. The greatest compliment Michael Angelo ever paid Raphael—although it is doubtful if he thought so at the time—was, that Raphael did not get so far by his genius as

by his industry. This industry means nothing else than the success an artist seeks in the unwearied improvement of his work. Industry is not so much persevering activity or diligence in general as absorption in the one thing to be accomplished. The mark should be right before the student; the higher the better; ambition is a grand quality, so that it does not degenerate into egotism, and is more productive of good and great work than any other desire of man. Strike high, and do not believe in failure; work incessantly and rightly, and good work will be the result.

ON A NEW SERIES OF CHEMICAL REACTIONS PRODUCED BY LIGHT.

BY JOHN TYNDALL, LL.D., F.R.S., ETC.*

PHYSICAL CONSIDERATIONS.

I sought to determine the particular portion of the white beam which produced the foregoing effects. When, previous to entering the experimental tube, the beam was caused to pass through a red glass, the effect was greatly weakened, but not extinguished. This was also the case with various samples of yellow glass. A blue glass being introduced before the removal of the yellow or the red, on taking the latter away augmented precipitation occurred along the track of the blue beam. Hence, in this case, the more refrangible rays are the most chemically active.

The colour of the liquid nitrite of amyl indicates that this must be the case; it is a feeble but distinct yellow; in other words, the yellow portion of the beam is most freely transmitted. It is not, however, the transmitted portion of any beam which produces chemical action, but the absorbed portion. Blue, as the complementary colour to yellow, is here absorbed, and hence the more energetic action of the blue rays. This reasoning, however, assumes that the same rays are absorbed by the liquid and its vapour.

A solution of the yellow chromate of potash, the colour of which may be made almost, if not altogether, identical with that of the liquid nitrite of amyl, was found far more effective in stopping the chemical rays than either the red or the yellow glass. But of all substances, the nitrite itself is most potent in arresting the rays which act upon its vapour. A layer one-eighth of an inch in thickness, which scarcely perceptibly affected the luminous intensity, sufficed to absorb the entire chemical energy of the concentrated beam of the electric light.

The close relation subsisting between a liquid and its vapour, as regards their action upon radiant heat, has been already amply demonstrated.† As regards the nitrite of amyl, this relation is more specific than in the cases hitherto adduced, for here the special constituent of the beam which provokes the decomposition of the vapour is shown to be arrested by the liquid.

A question of extreme importance in molecular physics here arises: What is the real mechanism of this absorption, and where is its seat?‡

I figure, as others do, a molecule as a group of atoms, held together by their mutual forces, but still capable of motion among themselves. The vapour of the nitrite of amyl is to be regarded as an assemblage of such molecules. The question now before us is this: In the act of absorption, is it the molecules that are effective, or is it their constituent atoms? Is the *vis viva* of the intercepted waves transferred to the molecule as a whole, or to its constituent parts?

The molecule as a whole can only vibrate in virtue of the forces exerted between it and its neighbour molecules. The intensity of these forces, and consequently the rate of vibration, would, in this case, be a function of the distance between the molecules. Now the identical absorption of the liquid and of the vaporous nitrite of amyl indicates an identical

vibrating period on the part of liquid and vapour, and this, to my mind, amounts to an experimental demonstration that the absorption occurs in the main *within* the molecule. For it can hardly be supposed, if the absorption were the act of the molecule as a whole, that it could continue to affect waves of the same period after the substance had passed from the vaporous to the liquid state.

In point of fact, the decomposition of the nitrite of amyl is itself, to some extent, an illustration of this internal molecular absorption; for were the absorption the act of the molecule as a whole, the *relative* motions of its constituent atoms would remain unchanged, and there would be no mechanical cause for their separation. It is probably the synchronism of the vibrations of one portion of the molecule with the incident waves which enables the amplitude of those vibrations to augment until the chain which binds the parts of the molecule together is snapped asunder.

The liquid nitrite of amyl is probably also decomposed by light; but the reaction, if it exists, is incomparably less rapid and distinct than that of the vapour. Nitrite of amyl has been subjected to the concentrated solar rays until it boiled, and it has been permitted to continue boiling for a considerable time, without any distinctly apparent change occurring in the liquid.*

I anticipate wide, if not entire, generality for the fact that a liquid and its vapour absorb the same rays. A cell of liquid chlorine now preparing for me will, I imagine, deprive light more effectually of its power of causing chlorine and hydrogen to combine than any other filter of the luminous rays. The rays which give chlorine its colour have nothing to do with this combination, those that are absorbed by the chlorine being the really effective rays. A highly sensitive bulb containing chlorine and hydrogen in the exact proportions necessary for the formation of hydrochloric acid was placed at one end of the experimental tube, the beam of the electric lamp being sent through it from the other. The bulb did not explode when the tube was filled with chlorine, while the explosion was violent and immediate when the tube was filled with air. I anticipate for the liquid chlorine an action similar to, but still more energetic than, that exhibited by the gas. If this should prove to be the case, it will favour the view that chlorine itself is *molecular*, and not *monatomic*. Other cases of this kind I hope, at no distant day, to bring before the Royal Society.

PRODUCTION OF SKY-BLUE BY THE DECOMPOSITION OF NITRITE OF AMYL.

When the quantity of nitrite vapour is considerable, and the light intense, the chemical action is exceedingly rapid, the particles precipitated being so large as to *whiten* the luminous beam. Not so, however, when a well-mixed and highly-attenuated vapour fills the experimental tube. The effect now to be described was obtained in the greatest perfection when the vapour of the nitrite was derived from a residue of the moisture of its liquid, which had been accidentally introduced into the passage through which the dry air flowed into the experimental tube.

In this case the electric beam traversed the tube for several seconds before any action was visible. Decomposition then visibly commenced, and advanced slowly. The particles first precipitated were too small to be distinguished by an eye-glass; and, when the light was very strong, the cloud appeared of a milky-blue. When, on the contrary, the intensity was moderate, the blue was pure and deep. In Brucke's important experiments on the blue of the sky and the morning and evening red, pure mastic is dissolved in alcohol, and then dropped into water well stirred. When the proportion of mastic to alcohol is correct, the resin is precipitated so finely as to elude the highest microscopic power. By reflected light such a medium appears bluish, by transmitted light yellowish, which latter colour, by

* Continued from p. 556.

† Phil. Trans. 1864.

‡ My attention was very forcibly directed to this subject some years ago by a conversation with my excellent friend Professor Clausius.

* On the 21st of October Mr. Ernest Chapman mentioned to me in conversation that he once exposed nitrite-of-amyl vapour to the action of light. With what result I do not know.

augmenting the quantity of the precipitate, can be caused to pass into orange or red.

But the development of colour in the attenuated nitrite-of-amyl vapour, though admitting of the same explanation, is doubtless more similar to what takes place in our atmosphere. The blue, moreover, is purer and more sky-like than that obtained from Brucke's turbid medium. There could scarcely be a more impressive illustration of Newton's mode of regarding the generation of the colour of the firmament than that here exhibited; for never, even in the skies of the Alps, have I seen a richer or a purer blue than that attainable by a suitable disposition of the light falling upon the precipitated vapour. May not the aqueous vapour of our atmosphere act in a similar manner? and may we not fairly refer to liquid particles of infinitesimal size the hues observed by Principal Forbes over the safety-valve of a locomotive, and so skilfully connected by him with the colours of the sky?

In exhausting the tube containing the mixed air and nitrite-of-amyl vapour, it was difficult to avoid explosions under the pistons of the air-pump, similar to those which I have already described as occurring with the vapours of bisulphide of carbon and other substances. Though the quantity of vapour present in these cases must have been infinitesimal, its explosion was sufficient to destroy the valves of the pump.

Iodide of Allyl (boiling point 101° C.).—Among the liquids hitherto subjected to the concentrated electric light, iodide of allyl, in point of rapidity and intensity of action, comes next to the nitrite of amyl. With the iodide of allyl I have employed both oxygen and hydrogen, as well as air, as a vehicle, and found the effect in all cases substantially the same. The cloud column here was exquisitely beautiful, but its forms were different from those of the nitrite of amyl. The whole column revolved round the axis of the decomposing beam; it was nipped at certain places like an hour-glass, and round the two bells of the glass delicate cloud-filaments twisted themselves in spirals. It also folded itself into convolutions resembling those of shells. In certain conditions of the atmosphere in the Alps I have often observed clouds of a special pearly lustre; when hydrogen was made the vehicle of the iodide-of-allyl vapour a similar lustre was most exquisitely shown. With a suitable disposition of the light, the purple hue of iodine-vapour came out very strongly in the tube.

The remark already made as to the bearing of the decomposition of nitrite of amyl by light on the question of molecular absorption applies here also; for were the absorption the work of the molecule as a whole, the iodine would not be dislodged from the allyl with which it is combined. The non-synchronism of iodine with the waves of obscure heat is illustrated by its marvellous transparency to such heat. May not its synchronism with the waves of light in the present instance be the cause of its divorce from the allyl? Further experiments on this point are in preparation.

(To be continued.)

MICRO-PHOTOGRAPHY.

BY M. JULES GIRARD.*

THE pictures which I have the pleasure of presenting to your notice this evening are the result of powerful enlargements of diatoms varying from 800 to 1,200 diameters, diatoms being plants of the most minute description, growing both in fresh and salt water. The beauty and perfection of their details, despite their infinite smallness, render them specially adapted for the production of enlargements of the greatest dimensions. They are composed of cellules of silica, sometimes hollowed out, sometimes in relief, and always possessing the greatest geometrical regularity in their organic structure.

To obtain clear objects suitable for enlargement, it is necessary to establish a relation between the lens and the length

of the camera; and the more powerful the lens, and longer the camera used, the greater will be this relation. There exists, however, a very variable limit, which is incapable of being passed without altering the sharpness of the object, and which is the result of experimental trials between these two combinations.

As the intensity of the light diminishes proportionally to the distance of the object, it is necessary to have recourse to a condenser often composed of several lenses corrected so as to prevent distortion, which gives sufficient illumination to impress the sensitive surface. The focussing must be rigorously exact, as the most inappreciable digression of the microscopic screw is sufficient to injure the sharpness of the object.

If enlargements of extraordinary size are required, a process similar to that used for making ordinary photographic enlargements may be employed. A small negative may first be obtained upon a thin strip of glass, which is afterwards magnified by means of the microscope. This method is a very delicate one, and necessitates very careful focussing with a magnifier, in order that the most minute details may be rendered as sharply as possible. In developing, there is likewise the difficulty of obtaining a suitable degree of intensity for the object: if the process is pushed too far, the light will be unable to penetrate; if the development is insufficient, the negative will lack clearness. Thus the pictures taken direct possess the double advantage of being easy to produce, and more exact copies of the original.

ON THE FORMATION OF PEROXIDE OF SILVER BY OZONE.

BY M. F. WOHLER.*

IF in the electrolysis of acidulated water a strip of silver is employed as the positive pole, the metallic surface soon becomes covered with a black substance; this body is no other than peroxide of silver, which effervesces with ammonia, disengaging nitrogen. It is amorphous, and not crystalline, as in the electrolysis of a salt of silver. This formation is a very interesting one, as it leads to the belief that, in all probability, ozone is produced at the negative pole. The current made use of was sufficiently strong to liberate ozone in employing platinum wires as electrodes, but with silver no trace of ozone was disengaged, and it is to be inferred, therefore, that the latter helps to bring about the oxidation of the silver.

When a film of peroxide of a certain thickness has been formed, bubbles of oxygen become liberated from the strip of silver, and, at the same time, metallic silver in an amorphous state is precipitated at the negative pole, there being, likewise, a small quantity of silver in solution. This is due, probably, to a secondary action produced by the sulphuric acid (used in acidulating the water) which accumulates round the positive pole.

The same phenomena are observed with a strip of silver plunged into a solution of sulphate of soda. With a solution of nitrate of potash no peroxide is formed, but the whole of the liquid becomes filled with finely-precipitated oxide of silver of a light-brown tint. In a solution of ferro-cyanide of potassium the silver becomes covered with a white deposit of ferrocyanide of silver. Finally, in a solution of bichromate, the metal strip is covered with crystalline chromate of silver, free from peroxide.

Correspondence.

PHOTOGRAPHERS' RELIEF FUND.

MR. EDITOR,—With reference to a photographers' relief fund, the question may be asked, Who is it that is a photographer? And, further, is it intended to select the sheep from the goats? Photographers will, I have no doubt, contribute liberally, at once, if the principles be organized and made

* Read before the French Photographic Society.

* *Annalen der Chemie und Pharmacie.*

known. In fact, for my part, I am prepared to pay in £5 at first, and £2 10s. yearly, or as may be agreed upon by the committee; and to make up a fund not less from any person would, I think, be worth the trouble. Not that I ever expect any benefit from such a fund, but still I consider at the old age of some photographers assistance may be required. If it were for nothing more than to show the spoil-trade gentlemen how they stand in the estimation of the profession, a distinction should be made. Let the arrangements be made on similar principles to mechanics' funds and the like, and there will be no doubt of success.—AN OLD DAGUERREOTYPIST.

AMATEUR CRITICISM.

SIR,—As I conclude, from the appearance of the letter of "Lux Graphicus," that you occasionally admit into your pages amateur criticism, will you permit me to say a few words on that gentleman's remarks, in which I will endeavour to be as good-natured and as plain-spoken as he.

Firstly, let me ask him what he means by saying that Messrs. Robinson and Cherrill's group of children is too suggestive of scissors and paste to be a good picture? Does he mean that "scissors and paste" are illegitimate aids, and should not be used? If so, he condemns, of course, all combination printing. Well and good; but why does he not say so at once, instead of sneering at an individual picture? If, on the other hand, he admits the legitimacy of combination printing, why sneer at "scissors and paste"? He might as well say the picture was too suggestive of the printing-frame or of the albuminized paper.

If he meant to say that the means by which the picture was produced were too palpable, it becomes a matter of individual judgment, and one ought to know who "Lux Graphicus" is before one can attach much weight to the judgment. I, for one, do not agree with him. I suppose, from its character, that the group in question must have been produced from more than one negative, but I must confess that I cannot detect it; and I examined very closely indeed for joins, or signs of what the onivous call "patchwork." In many respects, indeed, I considered this group as the finest picture in the exhibition, and as full of noble qualities. But this is a mere opinion, of no more value than that of your correspondent, whether he writes under the name of "Lux Graphicus," or that of "Ecce Veritas," as he clearly does in other pages.

Again, this unknown gentleman, commenting upon the works of known gentlemen, says of the portraits of Mr. Fry (or, at least, of some of them) that they are as "flat, white, and shadowless as a knob of sal-ammoniac itself." This, of course, everybody sees, is a piece of exaggeration, indulged in to introduce a feeble joke: the statement is not true. The pictures have too much contrast—at least, some of them have—to please my taste; the aim to secure brilliancy has in some cases been carried too far; but it is worth recording that I heard more than one person—of cultivated taste, too—point to these very pictures as amongst the gems of the room, whilst they styled Mr. Blanchard's—which I, as well as "Lux Graphicus," much admire—as "soft, but lacking brilliancy." As for the latter gentleman's pictures being equal to Adam-Salomon's "best works, without the elaborate touching-up which the latter exhibit," the statement strikes me as absurd. Mr. Blanchard's specimens are very first-class, especially photographically; but if he be the modest and discriminating gentleman he is reputed to be, none would so soon declare that his work still remained far behind the best work of the Frenchman in many points. The remark about the "elaborate working-up" of Salomon's pictures appears to me equally untrue and unfair. When his pictures are worked up there is nothing elaborate about it: it is plain, bold, and palpable, though generally judicious, as many of the specimens clearly showed. The two best—a lady in white, and one with a shepherd's plaid scarf—appeared to have scarcely a touch upon them.

My object in writing was to protest against dogmatic condemnation in amateur and anonymous criticism. I fear that I may have seemed in some degree to have been guilty of the sin against which I protest; if so, it will simply illustrate the evil, and suggest that it is scarcely in keeping with the wisdom you generally manifest, Mr. Editor, in conducting your journal, to admit amateur and anonymous criticism at all.—Your obliged servant,

LUX IN TENEBRAS.

[We do not, by any means, endorse all the opinions of "Lux Graphicus;" but if he were not known to us as a photographer

and artist of long experience, his views on the exhibition would not be placed before our readers. We have a few remarks on Amateur Criticism elsewhere.—Ed.]

PROPORTION OF SALT IN ALBUMINIZED PAPER.

DEAR SIR,—In your Studio Talk of last week you expressed an opinion that the discussion on albuminized paper should be closed, I presume, with Mr. Cherrill's reply, inserted in the same number of the NEWS. As a personal favour I beg you will give publicity to the present communication, as the question at issue is one of the greatest importance, not merely to paper albuminizers and dealers, but to the whole community of photographers; for in the event of Mr. Cherrill's erroneous ideas being allowed to pass unchallenged, the class first described will continue to suffer injustice, whilst the last alluded to will fail to perceive that a fair amount of skill only is required to overcome the want of uniformity which, for so many years, has been attributed to "that abominable paper."

It will be remembered that in my last letter I addressed to Mr. Cherrill a series of questions to which I requested distinct replies. The answers returned might be condensed into one short sentence: "We desire bricks; I cannot give you straw, but make bricks, though you employ base stubble." In other words: "I do not care by what method you arrive at conclusions, as long as you impart the information we can and will demand." Mr. Cherrill, however, is not too exacting; he perceives the difficulties, therefore has no objection to a little rough guessing. Surely he must have overlooked the fact that for years past dealers in photographic papers have been supplying their customers with the guess-atable information so ardently desired—silver nit. 60 grains, and so on. And the method adopted is a sound one for those who supply an honest paper. Know that as long as the silver bath is kept up to a certain strength, the paper they provide, when floated thereon, can be made capable of yielding the best results; and as Mr. Cherrill requires no greater amount of accuracy than can be obtained from rough guessing, what can he desire better than the information he might find in every publication devoted to the rudiments of photography, if he is not satisfied with the directions offered by the dealer?

Again, Mr. Cherrill would exact information from the albuminizer concerning the class of negative needed to suit a given paper. Mr. Cherrill is once more at fault. But few paper albuminizers are practical printers; *ergo*, these who are unacquainted with practical printing are not in a position to afford the information; whilst those who are thoroughly up in printing matters know full well that in competent hands a paper can be made to suit any class of negative.

"But how about uniformity?" enquires Mr. Cherrill. I reply, suspect that dealer of ignorance or dishonesty who would hold out the faintest hopes of uniformity being attainable with the papers he supplies, as long as "the old acetate bath" is made to do duty in the way indicated and practised by Mr. Cherrill, who prefers toning his prints "few at a time," and yet asks uniformity. As well expect uniformity in ordinary type printing by bidding the printer add oil to the ink after each dozen of proofs are struck off. The reason why, I have fully explained elsewhere, and need not recapitulate.

I now leave this question to my readers. Promising I shall trouble you no further in this matter, I remain, &c.,

Willesden, November 23rd, 1868.

W. T. BOVEY.

ASCERTAINING THE AMOUNT OF SALT IN ALBUMINIZED PAPER.

SIR,—After the reading of Mr. Cherrill's paper on the "Relation of Intensity to Tone," recently, there appears to have arisen some discussion as to the means of ascertaining the amount of salt in any sample of albuminized paper. One gentleman having suggested a method of doing so by chemical means, another observed that it was like "using a steam engine to draw a cork." While duly admitting both the force and originality of the remark, may I be permitted to observe that it is possible by a much more simple instrument, though certainly at times a dangerous one, to draw, if not a cork, at least an inference as to the strength of salt present.

I hope no respected female ancestor of mine (photographically speaking) will accuse me of a desire to impart, unasked, instruction in that simple, yet to many persons, gratifying operation, the art of sucking eggs; but in such case the mode I

adopt is as follows:—Bringing the sheet of paper in a vertical position before me, I simply project the tip of my tongue so as to come in contact with the albuminized surface, and I am thus enabled to form a sufficiently accurate estimate of the amount of salt present for all practical purposes. I need scarcely add that the value of the above method will be greatly enhanced when employed by a person of *cultivated taste*.—I am, sir, yours obediently,
BROMO.
London, November 18th, 1868.

PAPER TURNING BROWN ON DEVELOPMENT.

DEAR SIR,—I have often received great help through your valuable paper, and knowing how many must have received assistance from time to time through the difficulties of others being cleared up, I send you a confession of my own inability to discover the cause of paper fogging under development with gallic acid. The paper is treated in the same way at all times; yet some prints remain clean and white, whilst others fog, or turned quite through the paper, as if taken upon brown paper. The effect at times is not bad, but very trying when you wish a clean white face. The process is as follows:—

Saxe paper, salted with

Water	...	...	...	...	3½ ounces
Iodide potassium	...	...	...	...	1 drachm
Bromide potassium	...	...	...	...	1 scruple
Silvered with a 60-grain solution.					

Probable causes, temperature, want of acid in the developer under certain conditions.—Believe me, yours obediently,

G. R. GILL.

381, Kentish Town Road, November 16th, 1868.

[Possibly some of our readers, who may have had experience in enlarging processes by development, can give our correspondent a hint. On another page we add a few remarks on the subject.—ED.]

MR. BOVEY'S METHOD OF TONING.

SIR,—May I be permitted to offer my testimony to the great value of the system of toning published in your columns by your correspondent Mr. Bovey. I am indebted to him for a release from some of the worst of those annoyances which have hitherto accompanied the practice of silver printing, at the same time that I am enabled to obtain good results from negatives which heretofore would have been scarcely worth printing at all. The advantages I find are, among others, the entire absence of bleaching, with its attendant imp, "mealiness," and all the vexations thereto appertaining, particularly in the case of weak and "forced up" negatives, which have always been a source of trouble from this cause; the perfect preservation of the delicate tints just below the highest lights, on the presence of which the beauty of the photograph so much depends (presuming, that is, that they already exist in the negative, which is unfortunately not always the case); also the extreme purity of the whites, and the roundness and depth of the picture generally. The difference in the latter respect between prints treated by the usual process and those from the same negative by Mr. Bovey's plan I have, in many instances, found to be most remarkable. I feel that we owe our thanks to Mr. Bovey, both for the valuable improvement he has originated, and for the liberal and unselfish manner in which he has made it known to the photographic world.—I am, sir, yours obediently,

CHARLES W. SMARTT.

Stockwell, November 24th, 1868.

PORTRAITS UPON GRAVES.

SIR,—With reference to the subject of placing portraits of deceased persons upon their graves, which was mentioned in your columns a few weeks ago, it is, perhaps, worthy of note, that the custom is by no means a new one.

Ten years ago I stayed for some time at a little village named Lungern, in the valley of Sarnen, at the foot of the Brunig Pass in Switzerland. The little churchyard attached to the village contained about a couple of hundred gravestones—or, rather, grave-boards—on the majority of which were painted, in a very crude manner, the supposed likeness of the deceased. Weather and age had been so destructive to the paintings that the most distant date traceable upon them was thirty years back. The custom had probably been introduced by some

native artist, and afterwards kept up by the inhabitants of the village, for in none of the graveyards in the vicinity which I visited did the same practice obtain.—I am, sir, your obedient servant,

H. BADEN PRITCHARD.

General Photographic Establishment of the War Department,
Woolwich, November 25th, 1868.

PRINTING FORMULÆ.

DEAR SIR,—I have just seen in your paper a letter from Mr. Fry, containing several statements utterly at variance with my experience of printing matters.

I do not wish to enter into any controversy with Mr. Fry, but I merely write to point out that one or two of his remarks are apt to mislead those who are not well-up in printing matters.

According to my experience, it is quite as difficult to determine the strength of a nitrate bath made without nitrate of soda as it is when that salt is present. "Argentometers," as they are called, are quite useless when the solution has been used a few times, and I find it is only by observation and experiment that the right quantity of silver to add to the bath for each grain of paper can be determined. If a sheet of paper is salted with chloride of sodium, as soon as it is floated on the nitrate bath chloride of silver is formed on the surface of the paper, and nitrate of soda in the bath, and then, as Mr. Fry very justly remarks, "the argentometer cannot be used when other matters are in solution along with the silver."

It has never been my experience to find the excessive contraction from the use of nitrate of soda of which Mr. Fry speaks. He must, indeed, have had considerable trouble from his paper under such very trying circumstances as he mentions. I should not have been surprised if the paper had been said to contract or expand one-sixteenth of an inch, or even one-eighth, in a whole sheet; though even that would be more than I have ever seen during printing operations. But when Mr. Fry says that a sheet of paper contracts *five-eighths* of an inch, owing to the use of nitrate of soda in the printing bath, I can only say that such a statement reads so like one of Mr. Fry's very best jokes, that it is enough to make one, like Artemus Ward, "git up nights and laff." But, seriously, I have printed, this year, hundreds of pictures, of large size, and every one of them has been perfectly sharp, though I always use nitrate of soda in the printing bath.

Mr. Fry's statement that it was impossible to select from a batch of prints those in which nitrate of soda had been used, and those in which it had not been used, is, to me, a great argument in favour of the use of the soda salt; for if prints can be done with 40 grains of silver, and soda, equal to those with 70 grains silver to the ounce, it seems to me there must be a saving in using the weaker bath.

I do not think that if plenty of hydrochloric acid is added to the first washings of the prints, any more difficulty will be found in collecting the silver when nitrate of soda is present than when it is absent.—I remain, dear sir, yours truly, ANON.

DEAR SIR,—I have perused Mr. Cherrill's paper in the News on "Our Printing Room," and particularly that portion of it referring to the use of nitrate of soda in the printing bath, &c., where he supposes the bath to be kept up by the addition of 10 grains of silver to each sheet of paper, and occasionally of fresh silver solution.

I have also read Mr. Fry's letter, stating with what extreme care he experimented years ago, when, having strayed from shore without a pilot, after considerable drifting, he lauded himself (or his paper) safely again on the good, honest 70-grain bath.

It appears that both these gentlemen are satisfied with the results from the combination of nitrate of soda with the silver, and, as far as I have experienced for many months, I have preferred it to the strong uncontaminated silver till a few weeks since, when I was in as great a dilemma as Mr. Fry; but not being disposed to give up that which I believed to produce superior results at less cost, I considered the whole matter, and it appeared to me that a certain amount of silver was essential to produce certain results, much more or much less would disturb the balance. I had previously tested, by the ordinary argentometer, silver and soda, separately and combined, previously to working, but it was impossible for me at the expiration of three or four months to determine the relative proportions of each.

I was thus working in the dark, so I obtained from Mr. Hart a volumetric apparatus, and found, upon testing a bath, that instead of there being from 36 to 38 grains of silver, as I supposed (the old argentometer registering 54), it stood thus: silver 28 grains, and consequently nitrate soda, &c., 25. Having thus discovered my position, I set matters right at once by strengthening with silver to what suits my method of working, and at present all goes on well. By occasional testing I believe I shall keep the bath in good and constant order, *ad infinitum*. The trouble is a mere bagatelle, and the expense even less.

Having derived much benefit from the experiences of both these gentlemen, I venture, through the NEWS, to give one of my own, that not only the one may be relieved from his supposition, and the other saved from his driftings (should he again venture out), but that others having a fixed datum upon which to work may be able, at any time, to ascertain for themselves the actual strength of their silver bath.—I remain, yours truly,

Southsea, November 23rd, 1868.

FORWARD.

Talk in the Studio.

THE PHOTOGRAPHIC EXHIBITION.—A contributor to the late exhibition in Conduit Street writes to the effect that although he did not call to remove his pictures until two days after the nominal close of the exhibition, it was somewhat difficult to get them away without rudeness, so constant was the flow of visitors into the room.

MR. HOWARD'S PICTURES AT THE SOUTH LONDON MEETING.—Mr. Howard calls our attention to an error of figures in describing his charming little pictures exhibited at the last South London Meeting. The report stated that he took two pictures on a $7\frac{1}{2}$ by $5\frac{1}{2}$ plate, but the pictures were described as $3\frac{1}{2}$ by $2\frac{1}{2}$, instead of 5 by $3\frac{1}{2}$, which is obviously the actual size, and also, as it will be seen, a better proportion than that described by the erroneous figures.

PLAIN PRINTS ON ALBUMINIZED PAPER.—A correspondent says:—"I had just written a note intending to ask your opinion on printing on the back of albuminized paper, when I observed your notice of the same in the last NEWS. I have used it so for some time, because I could not obtain plain paper. I have written to different houses in London for plain paper without success. First I placed the back of the albuminized paper on the negative after being floated in the ordinary way, but the print was not vigorous enough; then I floated it on its back, and found it answer very well indeed. I have often used it for very hard negatives, as it gives softer pictures than when printed on the albuminized side. The albumen also is a capital sticking stuff for mounting. I run a thin coating of gum arabic over the albumen, which together sticks better than anything I have tried."

ABYSSINIAN SCENERY, ETC.—The *Times* has the following:—"Some photographs now being exhibited at Maclean's, in the Haymarket, suggest a question which we should like to ask the War Office, or whatever may be the proper authority. They are photographs of Abyssinian scenery from sketches taken on the spot by Major Hogg, who served in the Quartermaster-General's Department from Zeolla to Magdala, and they give an admirably accurate idea of places, always interesting, if only from their peculiar picturesqueness, but now specially interesting from their association with historical events of which the nation has so much reason to be proud. The sketch of Magdala, for instance, is singularly faithful. We want to ask why the authorities—whenever they may be—do not follow Major Hogg's example, and give the British public the benefit of the photographs taken in Abyssinia by Major Pritchard's company? No labour was spared in taking them, they are admirably done, and so full of interest that it is a great pity they should "waste their sweetness on the desert air" of a few military offices. Do there exist any reasons of State for not publishing them? Economy can scarcely be the motive, for their sale would, we are sure, far more than defray all the expenses attending publication." Mr. H. B. Pritchard, in answer to this, informed readers of the *Times* that the pictures were exhibited at the Photographic Society's rooms in Conduit Street, and added that it was intended, he believed, to issue from the Royal Engineer establishment at Chatham complete

sets of the prints to the British and South Kensington Museums, and also to the various learned societies, so that the labours of the photographic staff in Abyssinia will be turned to very good account. We may add, that as all military officers can purchase copies, possibly many interested in their possession may be able to procure them through military friends.

NEW SOURCE OF CITRIC ACID.—The *Scientific Review* says:—"Professor O. Silvestri, of the University of Catania, has recently discovered an abundant quantity of citric acid in the fruit of *Cyphomandra betacea*, a plant of the family of *Solanææ* (the *Solanum betaceum* of Cavanilles). This plant is found here and there in the gardens of Sicily. It is a native of New Spain or Mexico, whence it has diffused itself into Peru and other parts of South America, where it is called *Tomate de la paz*. It is a ligneous perennial, and attains in Sicily some four yards in height. Its fruit yields to analysis one to one and a-half per cent. of pure citric acid. This acid, which probably exists also in our tomato sauce, has already been discovered by Bertagnini in the potato, and will, doubtless, be found in the fruit of all other plants of the family of *Solanææ*."

PORTRAIT DISCOVERED.—A daily contemporary says:—"An interesting discovery has just been made at Paris of a portrait of Marie de Medicis, of the date of 1692, when the Queen was 28 years of age. Her Majesty is represented in the florid style of Rubens, with a large collar of guipure on her neck, half covering a necklace of white pearls, to which is attached a cross in bright steel over a dark silk moirée dress, with a band set with precious stones round the waist. The blond hair is crisped and rolled round the head, and surmounted with a small black cap. The treatment of the accessories and the execution of the work leave no doubt that it is the production of the younger Porbus."

CONSTITUTION OF THE SUN.—Mr. Balfour Stewart, writing to the *Athenæum*, described a double discovery—that is, a coincident discovery by two persons—of certain important facts in connection with the physical constitution of the sun, and of the possibility of making spectroscopic research into the character of the red prominences without waiting for the occurrence of an eclipse. Mr. Norman Lockyer, assisted by the Royal Society with means, has for some time been engaged in the spectroscopic examination. During the late eclipse M. Janssen, the French observer, settled the questions that had been raised regarding the constitution of the red flames, proving that these were composed of incandescent gas, inasmuch as their spectra consist of bright lines, and the results received afterwards from Capt. Herschel and Major Tennant, our Indian observers, confirmed the truth of these observations. Mr. Lockyer, writing to Mr. Stewart on the 20th of October, says:—"Got a prominence with the new spectroscope; got the positions of three lines; one corresponding to C absolutely, one to F very nearly, one eight or nine degrees of Kirchhoff's scale more refrangible than the most refrangible D line." M. Janssen, writing of the eclipse, says:—"Immediately after the totality two magnificent protuberances made their appearance; one of them, of more than three minutes in height, shone with a splendour which it is difficult to imagine. An analysis of its light showed me directly that it was formed by an immense column of incandescent gas, principally composed of hydrogen. . . . The most important result of these observations is the discovery of a method of which the principle was conceived during the eclipse itself, and which will allow of the study of protuberances and of the regions surrounding the sun at all times, without its being necessary to have recourse to the interposition of an opaque body before the sun's disc. This method is founded upon the spectral properties of the light of the protuberances—light which resolves itself into a small number of very luminous pencils corresponding to the obscure rays of the solar spectrum. The day after the eclipse the method was applied with success. I was enabled to assist at a new eclipse, as it were, which lasted throughout the entire day. The old protuberances were greatly modified—they remained scarcely any trace of the great protuberance, and the distribution of the gaseous matter was very different." Mr. Steward says:—"Here, then, we have a very marked instance of two observers, quite independently of each other, observing the same fact with certain differences. M. Janssen, it will be noticed, declares for hydrogen, but names no lines; he considers the bright lines as coincident with the dark lines of the spectrum. Mr. Lockyer, however, has not obtained this coincidence—in fact, in a further communication received from him, he lays stress on the want of complete coincidence except in one case, without in the meantime attempting

to interpret the cause. Probably his spectroscope is more powerful than that of M. Janssen. But for this point, and doubtless many others, we must wait for the promised detailed communication to the Royal Society. These differences of fact, while they render the problem of great scientific interest, are not the only differences which ought to be borne in mind. Although the priority of observation is due to M. Janssen, yet the possibility of the discovery was suggested by Mr. Lockyer more than two years ago, and to my knowledge he has been working at it since that time; whereas M. Janssen frankly acknowledges that the idea only occurred to him during the eclipse itself."

To Correspondents.

STRIKE-A-LIGHT says:—"I prepared several collodio-bromide plates according to Messrs. Sayce and Brother's plan, one of which I exposed and developed the other day. Finding that the intensity was not sufficient for printing, I intensified (or, rather, did not) with bichloride of mercury, when, to my astonishment, the picture, on drying, vanished altogether." The circumstance described by our correspondent is very curious, and, although we are familiar with the fact, we cannot with certainty explain it. There is a singular difference in the behaviour of images simply consisting (like those of an iron developed wet collodion plate) of reduced silver, and those formed partially from an organic salt of silver—as we believe all dry-plate images are. The latter probably consist of metallic silver and oxide of silver. Certain it is that such images behave very differently to the ordinary iron developed image under the action of chloride of mercury. A pyrogallol developed image on a wet plate frequently bleaches under the action of mercury, but does not acquire intensity. All dry-plate negatives almost are injured by the action of chloride of mercury: they assume a faint bluish white tint by reflected light, whilst the intensity is reduced to a mere phantom, scarcely perceptible, by transmitted light. The best mode of intensifying dry-plates is by the use of silver and pyro; or, if it be desired to change their colour, it is probable that the method of intensifying by permanganate of potash would be found available.

W. J. A. G.—The chief defect in No. 1 is in the plate. A trace longer exposure, or a little more patience in development, would have been useful; but the subject is not well lighted. Remember that in landscape photography it is of the first importance that the scene should be so lighted as to produce pictorially a satisfactory amount of light and shade. If it be illuminated with an equally diffused light all round, a tame, flat, unsatisfactory picture must be the result. Either from sunlight or the action of bright clouds, it is desirable to have the subject illuminated from one source, which should be preferably from one side. The same defect characterizes No. 2, which is really a little over-exposed. No. 3 required better lighting, and a little more patience and bromide in development. Look to the shading of the lens from all skylight not forming the picture. No. 4 is chiefly spoiled by defects in the plate. The negative from which the transparency was printed appears to have been a little hard. Nothing but the extreme care and cleanliness will produce clean backgrounds in such a case; great care to avoid dust on the plates, great cleanliness in developing-cups, great care that the solutions do not become turbid, and precision throughout. When you see Mr. Gordon's operations, note the extreme care and cleanliness of every detail. The oxymel process is one of the oldest of the preservative processes, and one which produces very good results. It fell into disuse chiefly because of the somewhat sticky surface of the plates. We have posted a letter to you.

ASTONIOUS.—Mr. Solomon's apparatus for enlarging by means of the magnesium light appears to be very excellent. We believe that Mr. Solomon supplies the paper ready for sensitizing, and instructions for the best mode of working. See an article on printing by development in present number. A saturated solution of gallic acid is generally the best developer for paper prints. Whether acid is necessary with it, or not, depends somewhat on the preparation of the paper.

J. W.—A pint of fresh fixing solution containing 4 ounces of hyposulphite of soda will very safely fix half a dozen twelve by ten pictures, whether they be put in altogether, or singly in succession. 2. Old silver stains are more difficult to remove than new ones. Apply tincture of iodine freely to the stain, and then apply strong hypo or cyanide.

PHOTOS.—Mr. England's photographs can, we believe, be obtained of Marion and Co.; his own address is St. James's Square, Notting Hill. 2. We do not know of any means whereby you can procure one of M. Salomon's pictures. It is probable that you can procure an example of the style of picture he issues by applying to some one of the gentlemen who have exhibited such

pictures at Conduit Street, whose names you will find mentioned in our recent notice of the exhibition. 3. A bag is placed in the aperture at the bottom of the box, just large enough to contain the bath.

C. T. NEWBERRY.—We will duly forward the P.O. order to the treasurer of the North London Society.

CITRIC ACID.—There will be no impropriety in your increasing the strength of your developing solution for winter use; but the chief cause of your difficulty is in the useless obstruction of light. A north light always is a diffused light, and when you "putty" your north side for the purpose of diffusing the light, you simply waste a great deal of light, not only by the obstruction, but by the yellow tint it soon acquires. Remove all this from your north side-light at once, and you will find a great reduction in the time of sitting; if that is not sufficient, remove the paint from the north top-light, which will still further reduce the exposure. Let us know the result.

N. C. EVANOFF.—Your work generally appears to be very good; it is clean, brilliant, and round. There is just a little too much top-light, which causes some tendency in the shadows under the upper lip, the chin, &c., to be a little blacker than is desirable.

F. D.—The plan is a very good one; but, as we have not seen such a studio in use, we cannot say that it is the best. We can see, however, no disadvantage in the form, and should prefer it to a roof of half-cylindrical form recommended by the same writer. Fluted glass is only of service where direct sunlight is concerned. For a south light, it is useful as assisting in diffusing the light; for a north light, we should not use the fluted glass.

OLD DAGUERREOTYPYST.—We publish your letter referring to the Relief Fund. You are surely in error, however, in supposing that the best men in photography have secrets to propose. All the men who have done the highest and best work in photography, and who have achieved the highest success, have been the most ready to communicate and describe most fully all their operations.

G. H. (Manchester).—You are scarcely specific enough in your question. You do not state whether you wish to transfer to plain paper or the "porcelain" paper; nor do you state which method of transferring you adopt, nor where you fail. The glazed or "porcelain" paper is sold ready prepared to receive the transferred film, but plain paper you must prepare for your own use. We have described as fully as we can both the wet and dry methods of transferring; but if you will state which method you employ, and in what point especially you fail, we will endeavour to help you. We regret that we have not time to enter into private correspondence on points of this kind.

IGNORAMUS.—A variety of theoretical reasons for the use of nitrate of soda in the printing bath have been given; but, on the whole, it seems a little uncertain as to what is its precise function. The fact, however, is affirmed by many veritable printers that there is a considerable advantage in its use, and that it permits the use of a weak silver bath without risk of bad prints. Most printers are agreed that an old silver bath gives better prints than a perfectly new one; and as an old bath has acquired an accumulation of nitrate of soda or of ammonia, the addition of such salts to the bath is said to give the advantage of an old bath. The value of the addition is still a subject of discussion, but the balance of evidence seems to be in its favour, and we think we could, if space permitted, give some good reasons why it may be useful.

THOMAS STOTHARD.—The Year-Book for 1869 will be out at the latter end of December. That for 1864 forwarded. We did not find the group of statuary to which you refer in your letter.

H. DIXON.—We have made enquiry, and find that the envelope containing the card was posted at a pillar-post in the northern district on Wednesday the 18th. We are sorry you have not received it. The best plan will be to apply to the Postmaster-General by letter, describing the envelope and address, and stating circumstances.

A. B.—Upon treating the precipitated sulphide of silver with nitric acid, and warming in a test-tube, the silver will be taken into solution, and can be readily detected by the addition of common salt to a few drops of the liquid. With regard to the sulphur, much of this will commonly be left insoluble, and assume the form of a semi-fused globule; there will, however, always be a small proportion oxidized and dissolved, and this can be recognized in solution by one of the usual tests for sulphates, viz., nitrate of baryta, producing a white precipitate insoluble in dilute nitric acid.

T. G.—Thanks.

A CORRESPONDENT WITHOUT SIGNATURE.—The letter was duly forwarded.

D. WINSTANLEY in our next.

Our final Notice of the Photographic Exhibition, together with several articles in type, are compelled to stand over until our next.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XII. No. 535.—December 4, 1868.

CONTENTS.

	PAGE
The Goddard Relief Fund	577
The New Secretary to the Photographic Society	578
A Photographers' Relief Fund	578
Exhibition of the Photographic Society	579
Echoes of the Month. By an Old Photographer	580
Foreign Miscellanea	582
The Goddard Fund—Report of the Committee.....	583

	PAGE
On a New Series of Chemical Reactions Produced by Light. By John Tyndall, LL.D. F.R.S., etc.	584
Correspondence—A Photographers' Relief Fund—Lux Graphics in Defence—Iodide of Mercury Intensifying—Amorphous Albuminized Paper.....	585
Talk in the Studio	587
To Correspondents.....	587
Photographs Registered	588

THE GODDARD RELIEF FUND.

WE feel sure that we shall be pardoned by the generality of our readers for occupying part of our space this week with an official report and a few remarks on a matter which, in a direct manner, concerns only a few of them—the subscribers to the Goddard Relief Fund, less than three hundred in number. Besides these, the subject may possess an incidental interest to those whose attention has of late been fixed on the importance of a general relief fund for photographers; and possibly also to the still smaller number who may have felt any interest in the foolish rumours circulated by a few mischievous persons as to alleged malversation in connection with the fund in question. And, finally, in justification of devoting some space to the matter now, it should be stated that a good proportion of the money was contributed through this Journal in response to an appeal made in its pages; and there is a fitness in publishing the final report of the committee in the same columns.

The story is pretty well known, but we may very briefly restate the leading facts. Mr. J. F. Goddard, originally a lecturer on popular science, became, in 1840, connected with the then newly-discovered art of photography, and by his early experiments materially contributed, if not to make Daguerreotype portraiture a general possibility, at least to improve its quality and practice. After many years of connection with the art, he was left behind in the struggle for profit and honours, and old age found him with enfeebled and precarious health, mental and bodily, and still more enfeebled and precarious means. He was old, infirm, and very poor. His only resources for subsistence were a few pounds subscribed annually by the friends who knew something of his history, and believed in his necessities, if not in his great services to the art.* Mr. T. R. Williams was the almoner of these few contributions, which averaged, so far as we remember, not more than about £15 a year, which just kept the recipient from actual starvation. We were amongst the limited number of contributors, which we occasionally attempted to extend; and in such efforts we chanced to bring the matter under the attention of Mr. Jabez Hughes, who, with characteristic energy and generosity, at once proposed a general appeal to photographers for means of immediate, if not of permanent, relief. We cordially seconded the idea, which was at once carried out. "A few facts and an appeal" in connection with the discoverer of the use of bromine in collodion were written by Mr. Hughes, and inserted willingly in the journals connected with photography, the editors of which (namely, Dr. Diamond, Mr. Shadbolt, and ourselves) as well as Mr. T. R.

Williams and Mr. Hughes, undertaking to receive subscriptions. Besides these appeals, upwards of two thousand circulars and many hundred of letters, written personally, were issued by Mr. Hughes, and sent all over the world where photographers could be discovered. The response to this appeal was liberal, and upwards of £370 were contributed. We may incidentally mention here, as a matter of historic interest, that in the exuberant desire to present the claim strongly, Mr. Hughes discovered, in the course of the immense correspondence which followed, that he had somewhat exceeded fact in his statement, and various protests accompanied some of the contributions. In America Mr. Goddard's claim to the application of bromine to the Daguerreotype process was altogether ignored, and it was ascertained also, from published documents, that both Sir John Herschel and Mr. Fox Talbot had preceded Mr. Goddard in the use of bromine. That Mr. Goddard was honourably connected with early progress in the art there can be no doubt; and upon this subject it is not necessary to enter into further detail here.

On the receipt of liberal contributions a new question arose. No organization and no responsible body existed for dispensing them. It became something like a necessity, therefore, that those through whom the funds were contributed should form a committee to consider their disposal; and the gentlemen we have named assumed that office, Mr. Hughes, to whom the bulk of the subscriptions were sent, practically becoming treasurer, conjointly with Mr. T. R. Williams, who also, being in most constant contact with Mr. Goddard, became dispenser of the fund. Very early after subscriptions began to be received, Mr. Goddard was relieved from the pressure of immediate want by a portion of the money contributed; but it became apparent, on a little reflection, that no permanent method of relief could be carried out on that system.

In the appeal first made it was proposed to relieve Mr. Goddard from immediate need, and a hope was expressed that his remaining years might be spent "free at least from the anxieties of physical want;" and, as funds began to flow in, it became important to consider how the committee could carry out their implied pledge to care for his remaining years. The purchase of an annuity was the obvious means of meeting the end, and in the two thousand circulars and many hundreds of personal letters to which we have referred, the appeal for funds to purchase an annuity was expressly made, and by far the larger proportion of the amount was contributed under those conditions.

But here a new difficulty arose. Mr. Goddard wished to have the whole of the funds placed unconditionally at his disposal, and a series of schemes for its appropriation were proposed by him in succession, in none of which was any security offered for his future subsistence. His antecedents

* It is perhaps due to the memory of the late Mr. Claudet, also now gone, to say, that whilst he systematically denied the nature and extent of the claims made for or by Mr. Goddard, he was one of these subscribers, as he was afterwards a liberal contributor to the relief fund.

presented a saddening record of his unfitness to have irresponsible charge of his own welfare, which age had in no-wise removed. We pause at this stage, without entering into a history of the troubles of the administrators, and remember the good old maxim, *de mortuis nil nisi bonum*. Suffice it to say here, that it was pointed out to him that the committee felt they had no alternative in the matter. Prudence rendered it desirable that the fund should be invested in an annuity; good faith to the subscribers of more than two-thirds of the amount rendered it imperative. Whilst anxious to obtain the uncontrolled use of the whole sum, he promised oft, and as often evaded, the signing of the official document identifying him with the annuity policy, and without which it could not be completed; and before any definite step was effected, he died.

During the whole of the period in which the fund was in course of collection, during the time which the medical man required for observation before he could give promise of possibly prolonged life, and during which Mr. Goddard delayed from time to time the necessary signature for securing an annuity—a period of something less than three years—he was in the receipt of an income from the fund sufficient to supply moderate wants. He had gratuitous residence, without food, in St. Joseph's Retreat, at Hammersmith, and the amounts he received from the committee averaged, during the period in which he was practically in their charge, about sixteen shillings weekly. The figures before us in the treasurer's account stand thus:—Payments made to Mr. Goddard, £104 18s. 8d.; tailor's and doctor's bills, incurred during these three years, paid for him, £4 12s.; a further sum of £5 paid to Mr. Goddard, but for which, no signature having been obtained, Mr. Williams declines to charge, making altogether £114 10s. 8d. The funeral expenses, which the committee paid, amounted, in round numbers, to about £20; for other disbursements we refer the reader to the balance-sheet.

Our object in this brief analysis is simply to show those of our readers interested in the question, that the declining years of the unfortunate gentleman were relieved from the pressure or fear of actual want, the grim spectre which had stood at his threshold during the years immediately preceding the existence of this fund. At the latter end of 1866, bronchitis—from which, in a chronic form, he had suffered for years—attacked him in an acute form, and he went to Middlesex Hospital, where, after remaining a few weeks, he died in the December of that year. Perhaps one of the most satisfactory assurances of the sufficiency of the relief he continued to receive from the fund collected is derived from the fact that a few pounds—six or seven sovereigns in gold—were found in his pocket after his death by the ward attendant at the hospital, and handed over to Mr. Brothers, who claimed to act as the representative of the deceased gentleman.

After his death the balance of the fund naturally reverted to the subscribers. But now another trouble arose. A gentleman named Mr. G. Brothers, of whom the committee until then had known nothing, produced a will, made at an early period in the history of the subscription, in which Mr. Goddard—acting under the assumption that the funds would be placed in his own hands—had disposed of the prospective contributions. Mr. Brothers, as executor under this will, claimed the balance of the fund. On taking legal advice the committee learned that their own first impression was correct: that they held the money in trust for a special purpose; that this purpose having been as far as possible consummated, the balance belonged to the subscribers, and could not be applied in any other manner. What followed, and the cause of delay in closing their duty, those concerned already know, and we refer any others interested to the report for details. The balance in the ratio of their subscriptions is now in course of distribution to the original donors.

With this brief statement, the history of the Goddard Fund, in our pages, closes. Undertaken in kindness, carried

out in steadfast good faith, not without an amount of labour, difficulty, and anxiety far beyond what could have been anticipated, the committee have, we think, one specific source of satisfaction: that, so far as we know, every subscriber who has communicated with them—and the number has been large—has signified cordial approval of the course they have pursued. And when we speak of the committee, let us do an act of justice by a remark which we are in the best position to make: whilst, as the report states, the committee were in perfect unanimity in all their decisions, and each one accepted any share of duty or responsibility which fell to him, the chief labours were performed by two gentlemen, Mr. Jabez Hughes and Mr. T. R. Williams. In response to the single effort of Mr. Hughes, the greater part of the money was contributed. With the exception of about £100—upwards of £50 of which were contributed through the PHOTOGRAPHIC NEWS, and the remainder through two other journals and Mr. Williams—the total amount was sent to Mr. Hughes in reply to scores of personal applications, hundreds of written letters, and two thousand circulars, addressed by himself to photographers in all parts of the world. The duty—not always pleasant under the circumstances—of administrator was undertaken by Mr. Williams; and to these two gentlemen the subscribers are chiefly indebted for discharging, on their behalf, the arduous task just completed.

One word more. Suggestions well-meant, and rumours ill-meant, have reached the committee, hinting the desirability, or imputing the intention, of employing the balance as a nucleus of a general relief fund. After reading the brief history of the case, the kindly-disposed gentlemen who have suggested the desirability of such a course will perceive that any steps which could have been taken in such a direction would have added too seriously to the complications of a sufficiently troublesome responsibility.

THE NEW SECRETARY TO THE PHOTOGRAPHIC SOCIETY.

A SOMEWHAT premature announcement in a contemporary states that Mr. John Spiller, F.C.S., has been appointed secretary to the London Photographic Society. It will interest many of our readers to learn that Dr. Diamond, who has been for some time anxious to retire from the duties of secretary to the Society as soon as a suitable successor could be found, recently tendered his resignation to the Society, and asked the council to take steps to relieve him from the discharge of duties which the state of his health and his numerous other engagements rendered too exacting. His resignation will take effect at the end of the Society's year in February next; at which time he will have completed, we believe, his eleventh year as secretary to the Society and editor of its Journal. Mr. John Spiller has been appointed by the council, on the resignation of Dr. Diamond, as honorary secretary, in which duties he will probably have the assistance of another honorary secretary. Mr. Spiller will also act as editor of the Journal. The appointment is one which cannot fail to give general satisfaction, both from Mr. Spiller's standing as a photographer and a man of science, and from his estimable personal character which wins many friends, and makes no enemies. His ability, activity, and zeal cannot fail to be of great service to the Society. Other changes in the officers of the Society will be announced in due course.

A PHOTOGRAPHERS' RELIEF FUND.

As the probability of the establishment of a photographers' relief fund acquires more definite shape among the photographic public, some points regarding the nature of the organization and the limitation of its operation begin to be discussed. The question especially arises, For whose benefit

is such a fund proposed? The answers [which will be given by different persons are illustrated in letters in our present and recent issues, and these are types of others we have already published. One class would limit the aid to those only who could present proper credentials of their sole devotion to photography as a profession; whilst another class would extend the aid to all who needed it who may in any way have been connected with photography.

It is clear from the different views held on the subject that it needs a little discussion. One of our correspondents is under the impression that we raised the question as to whether hangers-on of the profession should be recognized in such a benevolent scheme. He is in error; we simply gave expression, as we at the time stated, to the question as raised by a metropolitan photographer of many years' standing in the profession, who wished that the question should be discussed, but himself rarely expressed his thoughts in writing. No matter, however, by whom the question is raised; if a fund have to be established, the subject should be discussed. At this stage of the inquiry it is not a matter of sentiment, but one of necessary prudence. It is a very plausible affectation of large-hearted generosity for a man to exclaim, "Oh, I would give to all without limitation, necessity alone constituting a fitting claim." But if the professor of this ample liberality were literally without means whereby his liberality might be tested his words would be of little avail. So if a system were established whereby funds could not be obtained, it would be quite useless, however comprehensive its professed charity. From the tenor of some of these letters we have received, the writers would be unwilling to subscribe to a fund which would extend help indiscriminately to all who had been connected with photography, whether it had been their sole profession or not; but they would readily contribute to a fund exclusive in its aims. Here we have a class—possibly a large class—representing a probably large annual subscribing power, who will contribute on conditions; and the question very properly arises, Can these conditions be met?

Although we have raised the question by giving expression to the voice of others, we have expressed no opinion on the subject ourselves. We hold, nevertheless, a very strong conviction on the subject. It is, that narrowness or exclusiveness will be the very worst course as a matter of policy, as well as a matter of benevolence, which can be taken; and we think that due reflection on two or three considerations will satisfy that class who at present are only prepared to subscribe on condition that photographer-mechanics, photographer-barbers, *et hoc genus omne*, shall be excluded from the provisions of the organization. First, let it be remembered that the probable largest contributors to such a fund will be wealthy amateurs, and these will be inspired with no sympathy with the notion of excluding from the fund all but the most precisely-defined professional photographer. The offer of £50, already made, is from an amateur, and no more sure means of cooling the interest of such gentlemen could be devised than the introduction of any spirit of narrowness into such a scheme, and no surer means of evoking warm and extended aid can be conceived than a spirit of catholic, but not reckless, comprehensiveness, in considering the objects of benevolence. As a question of policy, professional photographers have far more to gain than to lose by avoiding exclusiveness.

There is another consideration of policy worth a moment's attention. It is very improbable that many of the class who join photography to another occupation will ever be likely to become dependants on such a fund; for however undignified it may be—and it is, perhaps, a little painful to the dignity of some to see the professions of "chimney-sweep and photographer" conjoined on one sign-board—yet it should be remembered that such persons are rarely unthrifty. We may possibly lose caste in the estimation of some of our readers, when we confess to some degree of sympathy with those who so dwell on the border-land of photography. The attempt to practise photography gene-

rally indicates some degree of taste and ingenuity; and the conjunction of photography with some other business generally suggests a desire to "provide things honest in the sight of all men," and, therefore, such conjunction is, we think, a "failing which leans to virtue's side," always provided there is an aim to do good work and secure fair prices. But, in any case, the alliance of the two businesses generally argues thrift, and the thrifty man is the least likely to become an applicant for benevolence.

A third condition of prudence is, that there is a very large class, consisting of those employed in the manufacture of lenses, cameras, and photographic apparatus and materials generally, who would be just as probably contributors as applicants to such a fund; and that, in short, to attempt to limit its aid to the "photographer" only, according to the narrowest definition, would be probably to limit its contributions to the same class, a course which must of necessity seriously contract the chances of its establishment.

Finally, it might be asked, On what ground should exclusiveness be practised? What occult fitness is possessed by the photographer, according to the present definition, which he whose occupations are associated with photography does not possess? It may be answered—in fact, has been answered—that there are "hangers-on" to photography—men more likely to need the fund than to contribute to it—and that this should be provided against. In a benefit society such considerations would be of importance, but in relation to a benevolent organization such a consideration has no weight whatever. We presume that nine-tenths of the contributors will never contemplate the bare possibility of their own need of aid from such a source. The fitness of a claimant for relief out of the funds of a photographic benevolent fund will, we presume, be duly considered by the administrative officers who may be appointed, and the broader the basis upon which the claims shall be estimated the more in accordance it is likely to be, we believe, with the desires of the most important of the contributors.

The mere discussion of the subject now might be considered premature, if it were not for the fact that some are indisposed to promise to contribute until they know how wide or how narrow a basis is contemplated; and as we are anxious to be able to give the photographic world, in six months, some estimate of the amount in donations and subscriptions which may be anticipated if an organization is formed, we wish to remove any objection which might exist, on the score we have indicated, to make a conditional promise.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

FINAL NOTICE.

So far as any descriptive memoranda on the prints enable us to judge, the bulk of the contributions were produced by the wet process. The dry processes, however, although not extensively illustrated, present some very admirable examples, and these go far to prove that in the hands of skilful and careful men, almost every process will yield good results. The oldest, the Taupenot, in Mr. Wardley's hands and in those of Mr. F. Howard, gives some marvelously fine landscapes; and the newest, Mr. Gordon's gum process, gives in his hands prints which leave nothing to be desired. Mr. Whiting also exhibits some excellent results obtained by the gum process, and some scarcely less excellent by the tannin process. Mr. W. W. King's prints of tropical plants in Kew Gardens, taken with the tannin process, are very excellent. Mr. Beasley, as usual, excels with the Fothergill process. And these names, so far as we know, comprehended the names of all the dry-plate men who contributed.

The wet-plate workers were legion. Besides the charming Welsh views of Bedford, those in the Tyrol by

England, the exquisitely delicate work of Mr. Gordon, the beautiful little bits of Mr. F. Howard, which tread closely on the heels of those of Mr. Gordon, the admirable landscapes of Mr. Vernon Heath, of Mr. Spode, of Mr. Brownrigg, and others, whose works are well known, and the excellent and interesting Abyssinian photographs taken by the Royal Engineers during the recent war, which we have already noticed, there are very attractive pictures, possessing fine qualities, both artistic and photographic, by men whose names are less familiar to the photographic public. Amongst these, we may mention some singularly delicate landscape bits by Mr. Fernely, of Melton Mowbray. Without lacking any force, there was a delicacy of treatment which resembled that of a clever pencil drawing, and a crispness of definition like that of a steel engraving. Mr. Archer Clarke exhibited some fine landscapes, which were described as having been treated with the golden synp solution recently described in our pages. Also amongst the exhibitors of excellent landscape work were Mr. Crofton Atkins, whose bold mountain and cataract scenery was rendered with much picturesque effect; Mr. A. Irving, who exhibited some charming Killarney views; Mr. Greene, whose views in the Mauritius possessed much interest; Mr. Fox, who exhibited effective sea and cloud pieces; Mr. Heaviside, who exhibited some fine views in the picturesque neighbourhood of Durham; Mr. J. B. Best, who, with others, exhibited good pictures.

Most striking amongst the illustrations of special processes was the portrait of Lord Belhaven, reproduced by Mr. Annan from a painting in the last exhibition of the Academy. It was printed in carbon by the Autotype Company, and resembled a fine mezzotint engraving, which, however, in many respects, it surpassed. The same Company exhibited a portfolio of splendid carbon reproductions from old masters. Edwards and Co. exhibited a large and interesting collection of carbon or pigment pictures, consisting of portraits, enlargements, and examples of different applications and different tints. Mr. W. H. Smith exhibited some very interesting applications of photography to decorative work on wood, in which pictorial subjects, with borders, imitating the grain of ornamental woods, were both produced by photography, the method employed being, we believe, the gelatino-chloride of silver process.

Dr. Mann's ethnological studies from South Africa were strikingly full of character. The enamels of Mr. Henderson we have before mentioned as exceedingly perfect. Mr. Barnes also exhibited some good enamels, plain and coloured; and a gentleman in Hull, who described his work as that of an amateur, exhibited some very good enamels. Mr. Britton's collodio-chloride pictures on opal glass were very attractive. Mr. Alfieri exhibited a frame of excellent work, and full of interest, illustrating the art of pottery by views of the men at work in the various operations of potting. Mr. Jewell's dogs, and Mr. Avery's horseback pictures, received and were well worth attention. With the exception of the carbon reproductions already named, very few illustrations of this branch of photography were exhibited. Mr. Fred. Hollyer exhibited a fine reproduction of a painting by Rosa Bonheur; the Misses Bertollacci exhibited some capital reproductions from engravings of Turner's works, and Mr. Hubbard also exhibited a few good examples of copying. Mr. H. Dixon exhibited one or two of his fine reproductions and some other pictures, chiefly with a view to illustrate the effect of a preservative varnish which will effectually protect the print from the action of external agencies, and so contribute to the permanency of the print.

Of the coloured work we can only briefly indicate the character of the contributions. A very charming portrait, produced by the collodio-chloride process on ivory, and coloured in water colours, was exhibited by Mr. B. J. Edwards; and a water-coloured cabinet picture, exhibited by Mr. Burgess, was very interesting, and

closely resembling the effect of ivory. The bulk of the coloured work consisted of enlargements, some by Mr. Plumridge striking us as amongst the finest we have seen. The oil-coloured work of Mr. Edwin Davis was of very high character. Mr. J. H. Wills exhibited work of various qualities: a vignettted coloured head on a grey board was exceedingly fine. Lock and Whitfield's work in water-colours was, as usual, of the highest excellence. Messrs. Sawyer, of Newcastle-on-Tyne, exhibited two good enlargements, coloured in oil, one of which especially pleased us. Lenthall, Herring, Rees, Cunningham, Monnickendan, Palmer, and some others, exhibited very good coloured enlargements. Some coloured enamels by Mr. Bailey were especially fine and artistic in quality. Mr. Piercy's examples of his patented method of treating photographs were exceedingly excellent, and full of artistic finish.

Raines' panoramic camera, exhibited by Mr. Ross, and some photographs produced by it and by Mr. Ross's doublet, excited much interest. The method of obtaining a panoramic picture is very simple, and is analogous to that which has occasionally been effected by means of a stereoscopic camera: one-half of a view is first taken on one-half of the plate, the camera is then moved so as to bring the next half of the view accurately into position, and the front of the camera holding the lens moved so as to bring the second half of the view on the second half of the plate. The especial feature of this camera is the presence of an endless band, with serrated edges, placed just in front of the plate at the part where the two halves of the view join. This being kept in revolution during the exposure practically vignettes each half into the other, and so prevents any appearance of joining. A panoramic landscape exhibited by Mr. Wardley was produced from two negatives printed in succession on the same paper, and is admirably joined. A small pocket-camera was exhibited by Messrs. Negretti and Zambra. One of the most complete, convenient, and handsome camera-stands we have seen was exhibited by Mr. Hughes. Some admirable examples of folding-cameras, and some capital stands, were exhibited by Mr. Meagher.

Of the apparatus exhibited nothing was more interesting than the examples of the Holmes stereoscope, which Mr. Blanchard has recently called attention to. Mr. Meagher exhibited some handsome examples in polished walnut wood, which excited much attention and admiration.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

THE LATE EXHIBITION—SECRETARYSHIP OF THE PHOTOGRAPHIC SOCIETY—THE RELIEF FUND—PORTRAITS ON APPROVAL—THE SOCIETIES.

No photographic event during the month—in fact, none during the year—has possessed half the interest of the exhibition of the Photographic Society held in Conduit Street. A photographic exhibition is always interesting to a photographer, but this possessed a startling interest, from the degree of excellence possessed by the mass of the contributions, being so much in advance of anything which could have been anticipated. Technically, everything was perfect, and there was not a bad photograph exhibited; but, what was of far higher importance, the art qualities were so much in advance, in portraiture especially, of anything previously exhibited, that everyone was taken by surprise. That the great impetus in this direction was given by the attention which has been called to the pictures of M. Salomon seems to be generally admitted; but it is very gratifying to see so many good men willing to learn, and capable of learning; and it is pleasant to note, too, that even in what are, I presume, confessedly imitations, so much individualism is manifested—an individualism which will necessarily become more specific and marked,

and produce diversity of style, with, it is to be hoped, uniformity of excellence.

The exhibition has been so fully noticed that I shall not venture to comment upon any of the pictures. There is one reflection in connection with the subject somewhat apt to be forgotten, which I should like to impress upon the minds of photographers, as being very appropriate at the close of such a satisfactory exhibition. I would suggest how important it is for all interested in the art to strengthen the hands of the Photographic Society. Despite the heavy losses it has sustained through the maintenance of exhibitions in former years, being impressed with the vast importance of such exhibitions in advancing the art, and of their interest and value to photographers, the council, it appears, have resolved to maintain as an annual institution this exhibition inauguration of the winter session. However economically it may be done, it is clear that it involves some serious expenses and a vast amount of labour for somebody; and, although I believe that the Society does already include the mass of the respectable metropolitan photographers, and many in the provinces, I cannot help thinking that a society which undertakes the trouble and expense of opening gratuitously to photographers and the public such an exhibition every year, has a claim upon the support of everyone interested in the art. I have been led to these remarks by having observed in print—truly, in a very insignificant quarter, but still showing there are minds small enough for the kind of thought it embodied—a phrase alluding to the “exhibition in the Photographic Society’s rooms, not the exhibition of the Photographic Society.” As the trouble of arranging, hanging, managing, and opening gratuitously to the public for a week, and all the expenses of doing this, are undertaken and borne by the Photographic Society, I should like to know whose exhibition it is, if not that of the Society. Some of the exhibitors were not members of the Society, it will be said. True, although by far the greater part of them were. But there is nothing affecting the matter in this. At least nine-tenths of the pictures in the exhibition opened every May, in Trafalgar Square, are not by members of the Royal Academy; but who dreams of speaking of the display as other than the Royal Academy Exhibition?

Apropos of the Photographic Society, I see an announcement in the *Chemical News* to the effect that Mr. John Spiller has been appointed Secretary of the Photographic Society. It has been known for some time, I believe, that Dr. Diamond was anxious to resign whenever the council could release him from his duties; but I cannot help fancying that an announcement of a new appointment in the middle of the session must be premature.* In any case, however, I think that everyone will readily admit that Mr. Spiller will be the right man in the right place. A veteran in photography and photographic reputation, although scarcely yet in the prime of life, having attained high recognition in the scientific world as an accomplished chemist, and a man of pre-eminently courteous and conciliatory personal bearing, it would have been difficult, I think, to make a more efficient or a more popular appointment.

Last month, I ventured to hint that the subject of a Photographic Relief Fund had not been discussed in detail, and did not seem to have excited the general interest it deserved. The correspondence in your pages the last few weeks indicates a more general desire on the part of photographers to give attention to the matter. I am sorry, however, to see a spirit of jealous narrowness in some of the letters, and a disposition to exclude from prospective benefits the dwellers in the border-land of photography, or hangers-on to the art. I think that all considerations as to the claims of applicants for relief may very well be left to the consideration of the committee or officers of any organization which may be formed. Your proposed “test-

operation” is, I think, a happy idea. If all who are disposed to aid the formation of such a fund will forward to you intimation of their willingness to contribute, it will be easy to estimate the probable success of the project; and as the promise will be conditional, and depend upon the formation of a trustworthy committee, no one need fear the risk of promising aid to a project which might eventually fall into bad hands.

A recent letter in your pages, by Mr. Downes, raises a question of considerable importance. He protests against taking portraits on approval, a practice which is, he alleges, becoming common, so that a portraitist may have an hour or two of valuable time wasted in producing two or three negatives, proofs may be printed from them, and the sitter, from some whim, after disapproving of them, coolly leave the photographer with his labour for his pains. I should hope that such cases would not, under any circumstances, be common; but it is clear that if the practice of taking portraits on approval were established, they might easily occur. The case of the sitter may seem reasonable enough when he says that he cannot think of paying for portraits which are not like. But what is the practice of other trades in such matters? If a tailor or a shoemaker make a misfit, he will either alter the article or make another. But the customer would be considered as acting unfairly and dishonourably if he declined to allow a second trial, but withdrew his order altogether. Now, if he deal on this wise with the photographer, his conduct becomes as nearly dishonest as it is dishonourable. To engage the time of the portraitist in taking a negative, and then decline either to accept what is done or to sit again, when possibly the defect in the first attempt is due to the sitter himself, is clearly dishonest.

On the other hand, I think that portraitists will, as a rule, find their account in giving re-sits wherever a customer is dissatisfied. Suppose he decline to do so, and the customer, with a bad grace, pays for the smallest number of the prints he can order; it is quite certain that no more copies will be required from that negative. But if, for some real or supposed fault, the first portrait does not please, and a second sitting is given, the customer is propitiated and in a humour to be pleased with the next attempt; and, being pleased, probably gives a large order for prints, and, possibly, continues ordering for some time from the same negative. It is clearly the interest of the photographer to please his customer, even at the cost of a little extra and even unreasonable trouble, especially in these days, when it is not uncommon to order many copies of prints from one negative. Of course, there will always be fidgetty, unreasonable people whom it is impossible to please, but as these cannot be cured they must be endured. I remember an old portraitist who had a curious rule on the subject of re-sits. When customers found fault with a portrait, and asked to sit again, he found in many instances, not that the first was unsatisfactory, but that they wished to have the choice of two effects of dress. He made it a rule, therefore, to consent to a re-sit, on one condition, namely, that the first negative should be destroyed before the second was taken, and that the customer should consent, in any case, to accept the result of the second trial. In the majority of cases this was declined, and the first accepted, showing that there was, in reality, very little objection to the first, seeing that the customer would not take the chance of getting something better, seeing it might also be something worse. In the days when one or two copies were the common orders, such a plan answered; but now it is the photographer’s interest to keep all the negatives he takes, with a view to possible orders from all.

The proper remedy for any misunderstanding between the photographer and his customer I hold to be prepayment. Let a rule be systematically carried out, that the sitter’s name and instructions be at once entered in a book, and his money taken before he sits for his negative, as a

* See remarks in another page.—Ed.

traveller pays for his railway ticket before commencing his journey, or for his concert ticket before listening to the music.

The photographic societies have all commenced their winter sittings. The London Society had an interesting conversation at the opening of the exhibition in place of a meeting. The North London, in the absence of a paper, had a conversational meeting. At the South Mr. Pearce read a modest and interesting paper on natural backgrounds and open air effects in portraiture, upon which an interesting discussion followed. At the Edinburgh the annual meeting was held for reporting progress and appointing officers. A capital suggestion was made in the "curator's" report, to the effect that every member should present to the society his card portrait with his autograph appended, and so form a gallery of the members. At the Manchester Society the chief business was an interesting magic lantern display.

Foreign Miscellanea.

At the last meeting of the French Photographic Society M. Pachelo again called attention to the formation of spots upon positive prints, which he attributed to some injurious material in the mounting boards, whereupon M. Girard stated that as the cardboard is manufactured in the same factory as the mounts with gilt edges, it is very possible that the injury complained of arises from finely-divided metallic particles deposited upon the card, as pointed out by him some time since.

At the same meeting, M. Despaquis exhibited several transparent carbon photographs mounted upon glass, and obtained by means of a film of so-called leather collodion (*collodion-cuir*). The material is well adapted to the production of pictures of this description, as favourable results are obtainable even from inferior negatives; a film of the material is merely exposed under a negative, washed in warm water, and then mounted upon glass. The pictures have created so favourable an impression that many of the principal photographers of Paris are experimenting with it—to wit, MM. Disderi, Reutlinger, Lejeune, &c.

MM. Geymet and Alker, in a letter to the *Moniteur de la Photographie*, state that in dull weather they can use the magnesium light for their remodelling process.* For printing a negative, a pose of forty seconds' exposure will give an image sufficiently good for transferring; and for reproducing designs by means of the camera, an exposure of two minutes is necessary.

Under the title of "Recent Progress in Science," a series of articles have been published in the *Revue des Deux Mondes*, by M. Radau. One of these articles, on Photographic Chemistry, although containing no novelty, is, on account of its simplicity and clearness, worthy of perusal by photographers. Referring to a ray of light which is decomposed by a prism into six principal colours—red, orange, yellow, green, blue, and violet—M. Radau says:—"These rays, which affect the retina of the eye, constitute what is called visible light. They are warm rays, and capable of acting chemically upon certain substances which are called impressionable (sensitive), but they do not produce all the calorific and chemical effects obtained with sunlight. The visible spectrum is prolonged on each side by obscure rays; beyond the red line extends the region of obscure heat; and beyond the violet are the chemical or ultra-violet rays. The latter become visible under certain conditions, when they appear of a light-grey lavender tint; they do not produce heat, but they exert a powerful action upon impressionable substances."

In stating that the theory of photographic phenomena is still enveloped in obscurity, M. Radau proceeds:—

"Nevertheless, one may endeavour to group known observations and effects under several general categories. There are, first of all, the reducing agents. Under the influence of solar rays, oxygen and haloid bodies have a tendency to abandon the metals. Chloride and nitrate of silver become decomposed, and it is the same, generally speaking, with chlorides, bromides, iodides, cyanides of the less oxidisable metals; the oxides, or suroxygenated acids, &c. In these cases light has the effect of destroying the affinities. There are, besides, the combining agents, in which affinities are, on the contrary, brought about by light. Oxygen, chlorine, bromine, &c., have a tendency, under the influence of light, to combine with hydrogen and organic bodies. A mixture of chlorine and hydrogen may be preserved for an indefinite period in obscurity, but if exposed to light it liquefies and gives birth to hydrochloric acid. Bitumen of Judea becomes insoluble under the action of light, because it absorbs oxygen; and a large number of essences and varnishes likewise become oxidised by light; gum-guaiacum assumes a bluish tint on oxidising. In mixing together a substance which tends to become decomposed under the action of light with another inclined to absorb one of the bodies which is separated, more energetic effects are produced. It is in this manner that organic matter facilitates the reduction of salts of silver by absorbing the oxygen disengaged. But what is most remarkable is the fact that if one only of two sensitive substances is exposed to sunlight, and both are afterwards placed in contact, the molecular action developed by the sunlight continues after the withdrawal of the substance from exposure, and, by bringing together the two substances, the same effect is produced as if they had both been subjected to the direct action of solar rays. Thus, for instance, in order to facilitate the reduction of iodide of silver, it is placed in contact with gallic acid after one of these substances has been exposed to sunlight, or even both have been exposed together. The effect produced as regards intensity is nearly always the same. Photographers denominate as *sensitive*, or *impressionable*, any material which receives and preserves the action of light, and give the name of *developer* to any substance capable of developing the image or completing the chemical reaction; but this distinction is of no essential value, inasmuch as the roles played by the two descriptions of bodies may be inverted."

Collodio-chloride paper is now made commercially in Germany, and advertised largely for sale. Each sheet is stated to contain three grammes of nitrate of silver, which is in most part recoverable from residues. The prices asked are somewhat high, being twenty-four shillings per quire of sheets 20½ by 12, or six shillings per gross of papers suitable for printing cartes-de-visite.

At a recent meeting of the Berlin Photographic Society, M. Stolze stated that he had experimented with good result upon a silver bath with permanganate of potash; the bath contained 4,000 cubic centimetres of solution, which was quite unserviceable, giving rise to pinholes and other imperfections. To this it was found necessary to add as much as 200 cubic centimetres of saturated permanganate solution in order to impart to the bath a red tinge. The precipitation and discolouration did not take place so rapidly as M. Stolze had been led to expect, as hours elapsed before the red colour changed to yellow. After a few days a yellowish turbidity of the bath was perceived, although the solution had previously been filtered, and it was not until the liquid had been sunned and treated with a few drops of cyanide of potassium that the difficulty was overcome. M. Stolze recommends the employment of permanganate for restoring silver printing baths to which sugar has been added for the purpose of preserving the whites of the albuminized paper.

M. Johannes Grasshoff publishes in the *Mittheilungen* a few remarks upon backgrounds and effects. He criticises the carpets generally used by photographers, intimating that as

* This was done by Mr. Joubert a year or two ago.—Ed.

a rule they are too good and showy, and that a quiet pattern, free from glare, should be employed. On this account a worn and bleached material will furnish better results than a span new article, as in the photograph the carpet should not be a prominent object, but very subdued in character. He remarks upon the occasional inconsistency of photographers who sometimes produce standing figures upon deal boards with a grand landscape background, and states that the time is evidently not far distant when the public will be treated with open-air scenery with fine carpeted foregrounds. To render an ordinary floor more suitable for landscape backgrounds, M. Grasshoff suggests the use of a wooden ledge, three or four inches wide, and about one inch thick, placed against the background. The ledge must be placed diagonally, so as to slope downwards to the floor, and painted of a dark colour, and covered thickly with glue, upon which dried moss or other similar materials are made to adhere; the join between the margin of the ledge and the floor should be as imperceptible as possible.

Some discussion has taken place at the last two meetings of the Berlin Photographic Society respecting certain collodion gun-cotton which has been received from New York, possessing a yellowish tint, which it imparts to the collodion. M. Kruger experimented with it, and found that the colour was not due to free acid, and that the material when boiled in alcohol remained unchanged, whereas the ordinary kinds were considerably swollen by the treatment; on adding a little iodide of cadmium to the alcoholic liquid obtained from the American sample, a yellowish colouring of the fluid was perceived, which did not take place in the fluids from the other specimens. M. Kruger's results led him to believe that the American gun-cotton had either been prepared in a liquid in the compounding of which the acids had not been used in the right proportion, or the acids themselves were too weak. M. Kleffel had also examined the gun-cotton, but had come to a different conclusion, believing that the colour was due to the acid mixture having been of too high a temperature. He found that the gun-cotton in question did not produce a transparent collodion, but one of a very friable character, when dry; neither did it dissolve entirely in ether.

At the same Society, a few remarks were made relative to the precipitation of residues. It was stated that chemically pure muriatic acid at once threw down the precipitate and clarified the water, whereas ordinary commercial acid often failed after some days in bringing about the same result. M. Junghans suggested the warming of waste liquids to facilitate precipitation, and Dr. Jacobsen recommended the addition of a solution of glue or gelatine to the same, which seemed to possess the property of combining with the precipitate, and falling down with it.

THE GODDARD FUND.—REPORT OF THE COMMITTEE.

[We have been requested to publish the following official Report of the Committee of the Goddard Fund.]

The Committee that undertook the management of this Fund beg to lay the following Report before their fellow-Subscribers:—

It will be remembered that in December, 1863, an appeal was made by Mr. Jabez Hughes to raise a fund to relieve the urgent necessities of Mr. J. F. Goddard, in consideration of services rendered to photography in its early days. This appeal was endorsed by Dr. Diamond, G. Shadbolt, Esq., G. Wharton Simpson, Esq. (the Editors of the Journals in which the appeal was made), and T. R. Williams, Esq., who had personally known Mr. Goddard for many years; and these gentlemen accordingly formed themselves into a Committee. The response to the appeal was the handsome amount of £374 2s. The original intention was immediately to purchase an annuity with the money raised; but as Mr. G. was then in feeble health, it was thought that if his life were likely to be a short one, it would be better to administer the money in

larger amounts than could be realized from a purchased annuity. To estimate how long he might probably live, the advice of a skilful physician was taken, who reported, after examining Mr. G., that though he was suffering from bronchial disease and affection of the heart, there was no immediate danger, and he proposed to make another examination after the lapse of twelve months, so that from the progress of the disease in the interval he could more accurately estimate the probable length of Mr. G.'s life. Mr. Goddard was therefore maintained by means of the fund, and at the end of the year underwent another examination. The report then given was that, though the disease had made progress, yet, the constitution being generally a strong one, it was not improbable that Mr. G. might live several years. It was now felt that the wisest course would be to carry out the original intention, and purchase an annuity with the balance of the money. Accordingly, after careful enquiry, an Annuity Office was selected where the largest annual sum could be obtained for the money, and the necessary papers for signature provided. To this Mr. G. objected. Indeed, he had all along demanded that the whole sum should be given to him to expend in any manner he thought proper. The gentleman who had raised the money felt it impossible to listen to this proposition; they represented to Mr. G. that the money was subscribed, in the words of the appeal, to relieve his necessities, and *preserve his remaining years* from the anxieties of physical want; and that if they parted with the money they had no guarantee that the original purpose would be secured. The truth is, that the Committee, from the information supplied by one of their members who had known him longest, had no confidence in Mr. G.'s judgment and prudence in the employment of the money. They were well grounded in this conviction, not only from this knowledge of his past history, but also by the crude schemes by which he proposed to dispose of the fund; the probability being that at the end of six months not a penny would be left, and that he would be in as great distress as ever. Otherwise, nothing would have been more gratifying than in this manner to have terminated the self-imposed trust. But it was felt that it would be neither real kindness to Mr. G. nor justice to the Subscribers—the greater proportion of whom had contributed with an express understanding that an annuity was contemplated—to have to end the matter in this unsatisfactory manner.

The Committee, who have acted all along with perfect unanimity, urgently pressed on Mr. G. the propriety of accepting the money in the form proposed, and promises were made by Mr. G., from time to time, that he would sign the Annuity Office papers; but these promises were as regularly broken. Meanwhile, he was in the constant receipt of sums of money at least equal to the amount he would have received from the Office, and very much larger than he had been receiving from precarious charity at the time when the appeal for help was made.

During these proceedings it was the source of great pain and trouble to those who dispensed the fund to find their best endeavours thwarted by the recipient of the bounty. In this state of the affairs Mr. G., after a short illness, died. Soon after, a Mr. G. Brothers produced a will, and, as executor, claimed that the balance of the fund should be placed in his hands, he (Mr. G. Brothers) being one of the chief legatees. On consulting a solicitor, the Committee were informed that they had no power to devote the fund to any purpose but that for which it was raised; namely, to relieve the necessities of Mr. Goddard. That object being, as far as possible achieved, the balance at his death reverted to the original Subscribers. On this advice action would immediately have been taken to distribute the money among the donors, but, litigation being threatened, they were advised, legally, that it was desirable to delay final proceedings. Sufficient time having elapsed, the Committee are unwilling to permit further delay in the removal of their responsibility in regard to the balance of funds, and, as nothing prevents the legal advice being carried out, the money will at once be distributed. The remaining balance in hand will permit a return of 12s. 6d. in the £ to the Subscribers, which sum, where their addresses are known, will be immediately remitted.

In making this repayment, it is gratifying to the Committee, and will be to the Subscribers, to know that—despite all the troubles that have arisen—Mr. G. was relieved from the deep penury in which he was found, that he received during his life more than he would have done from an annuity, and that

all expenses incurred in his illness, and in connection with his death and burial, including a memorial over his grave, have been defrayed out of the funds so munificently contributed.

STATEMENT OF INCOME AND EXPENSES.

Cr.	£	s.	d.	Dr.	£	s.	d.
Amount of subscription ...	379	2	0	Payments to Mr. Goddard during his life, and for medical, funeral, and burial expenses ...	129	1	8
Unpaid subscriptions ...	5	0	0	Printing, stationery, postage, and other expenses in collecting the fund ...	22	4	2
Interest ...	374	2	0	Legal expenses, unavoidably incurred ...	8	8	0
	25	3	4	Estimated expenses of distributing balance of fund ...	5	16	6
				Balance to return to Subscribers ...	233	15	0
	£399	5	4		£399	5	4

Signed, on behalf of the Committee,

JABEZ HUGHES.

November, 1868.

ON A NEW SERIES OF CHEMICAL REACTIONS PRODUCED BY LIGHT.

BY JOHN TYNDALL, LL.D., F.R.S., ETC.*

Iodide of Isopropyl.—The action of light upon the vapour of this description is at first more languid than upon iodide of allyl; indeed, many beautiful reactions may be overlooked in consequence of this languor at the commencement. After some minutes' exposure, however, clouds begin to form, which grow in density and in beauty as the light continues to act. In every experiment hitherto made with this substance, the column of cloud which filled the experimental tube was divided into two distinct parts near the middle of the tube. In one experiment a globe of cloud formed at the centre, from which, right and left, issued an axis which united the globe with the two adjacent cylinders. Both globe and cylinders were animated by a common motion of rotation. As the action continued, paroxysms of motion were manifested; the various parts of the cloud would rush through each other with sudden violence. During these motions beautiful and grotesque cloud-forms were developed. At some places the nebulous mass would become ribbed so as to resemble the graining of wood; a longitudinal motion would at times generate in it a series of curved transverse bands, the retarding influence of the sides of the tube causing an appearance resembling, on a small scale, the dirt-bands of the *Mer de Glace*. In the anterior portion of the tube those sudden commotions were most intense: here buds of cloud would sprout forth, and grow, in a few seconds, into perfect flower-like forms. The most curious appearance that I noticed was that of a cloud resembling a serpent's head: it grew rapidly; a mouth was formed, and from the mouth a cord of cloud resembling a tongue was rapidly discharged. The cloud of iodide of isopropyl had a character of its own, and differed materially from all others that I had seen. A gorgeous mauve colour was developed in the last twelve inches of the tube; the vapour of iodine was present, and it may have been the sky-blue produced by the precipitated particles which, mingling with the purple of the iodine, produced this splendid mauve. As in all other cases here adduced, the effects were proved to be due to the light; they never occurred in darkness.

I should like to guard myself against saying more than the facts warrant regarding the chemical effects produced by light in the following three substances; but the physical appearances are so exceedingly singular that I do not hesitate to describe them.

Hydrobromic Acid.—The aqueous solution of this acid was placed in a small Woulfe's flask, and carried into the experimental tube by a current of air.

The tube being filled with the mixture of acid, aqueous vapour, and air, the beam was sent through it, the lens at the same time being so placed as to produce a cone of very intense light. Two minutes elapsed before anything was visible; but at the end of this time a faint bluish cloud appeared to hang itself on the most concentrated portion of the beam.

Soon afterwards a second cloud was formed five inches further down the experimental tube. Both clouds were united by a slender cord of cloud of the same bluish tint as themselves.

As the action of the light continued, the first cloud gradually resolved itself into a series of parallel disks of exquisite delicacy; the disks rotated round an axis perpendicular to their surfaces, and finally they blended together to produce a screw surface with an inclined generatrix. This surface gradually changed into a filmy funnel, from the end of which the "cord" extended to the cloud in advance. This also underwent modification. It resolved itself into a series of strata resembling those of the electric discharge. After a little time, and through changes which it was difficult to follow, both clouds presented the appearance of a series of concentric funnels set one within the other, the interior ones being seen through the spectral walls of the outer ones; those of the distant cloud resembled claret-glasses in shape. As many as six funnels were thus concentrically set together, the two series being united by the delicate cord of cloud already referred to. Other cords and slender tubes were afterwards formed, and they coiled themselves in spirals around and along the funnels.

Rendering the light along the connecting-cord more intense, it diminished in thickness and became whiter; this was a consequence of the enlargement of its particles. The cord finally disappeared, while the funnels melted into two ghost-like films, shaped like parasols. The films were barely visible, being of an exceedingly delicate blue tint; they seemed woven of blue air. To compare them with cobweb or with gauze would be to liken them to something infinitely grosser than themselves.

In a second trial the result was very much the same. A cloud which soon assumed the parasol shape was formed in front, and five inches lower down another cloud was formed, in which the funnels already referred to were considerably sharpened. It was connected as before by a filament with the cloud in front, and it ended in a spear-point which extended twelve inches further down the tube.

After many changes, the film in front assumed the shape of a bell, to the convex surface of which a hollow cylinder about two inches long attached itself. After some time this cylinder broke away from the bell and formed itself into an iridescent ring, which, without apparent connection with anything else, rotated on its axis in the middle of the tube. The inner diameter of this ring was nearly an inch in length, and its outer diameter nearly an inch and a half.

The whole cloud composed of these heterogeneous parts was animated throughout by a motion of rotation. The rapidity of the rotation could be augmented by intensifying the beam. The disks, funnels, strata, and convolutions of the cloud exhibited at times diffraction colours, which changed colour with every motion of the observer's eye.

Moisture appeared to be favourable to the production of these appearances; and it hence became a question how far they were really produced by the light; hydrobromic acid, even from its solution, fumes when it comes into contact with the aqueous vapour of the air; its residence in water does not appear to satisfy its appetite for the liquid. The same effect, as everybody knows, is observed in the solution of hydrochloric acid. Might not, then, those wonderfully shaped clouds be produced by an action of this kind, the presence of the light being an unnecessary accident?

The hydrobromic acid was permitted to enter the experimental tube and remain in diffuse daylight for five minutes. On darkening the room and sending the electric beam

* Continued from p. 572.

through it, the tube was optically empty. Two minutes' action of the light caused the clouds to appear, and they afterwards went through the same variety of changes as before.

No matter how long the hydrobromic acid was allowed to remain in the tube, no action occurred until the luminous beam was brought into play. The tube filled with the mixture of air, aqueous vapour, and hydrobromic acid was permitted to remain for fifteen minutes in the dark. On sending the beam through the tube it was found optically empty; but two minutes' action of the light developed the clouds as before.

Permitting the beam to pass through a layer of water before entering the experimental tube, no diminution of its chemical energy was observed. Permitting it to pass through a solution of *hydrobromic acid*, of the same thickness, the chemical energy of the beam was wholly destroyed. This shows that the vibrations of the dissolved acid are synchronous with those of the gaseous acid, and is a new proof that the constituent atoms of the molecule, and not the molecule itself, is the seat of absorption.

Hydrochloric Acid.—The aqueous solution of this acid was also employed, and treated like the solution of hydrobromic acid. I intend to invoke the aid of an artistic friend in an effort to reproduce the effects observed during the decomposition, if such it be, of hydrochloric acid by light. But artistic skill must, I fear, fail to convey a notion of them. The cloud was of slow growth, requiring fifteen to twenty minutes for its full development. It was then divided into four or five sections, every adjacent two of which were united by a slender axial cord. Each of these sections possessed an exceedingly complex and ornate structure, exhibiting ribs, spears, funnels, leaves, involved scrolls, and iridescent fleure-de-lis. Still the structure of the cloud, from beginning to end, was perfectly symmetrical; it was a cloud of revolution, its corresponding points being at equal distances from the axis of the beam. There are many points of resemblance between the clouds of hydrochloric and hydrobromic acid, and both are perfectly distinct from anything obtainable from the substances previously mentioned; in fact, every liquid appears to have its own special cloud, varying only within narrow limits from a normal type. The formation of the cloud depends rather upon its own inherent forces than upon the environment. It is true that, by warming or chilling the experimental tube at certain points, extraordinary flexures and whirlwinds may be produced; but with a perfectly constant condition of tube, specific differences of cloud structure are revealed, the peculiarity of each substance stamping itself apparently upon the precipitated vapour derived from its decomposition.

When the beam, before entering the experimental tube, was sent through a layer of the aqueous acid, thirteen minutes' exposure produced no action. A layer of water being substituted for the layer of acid, one minute's exposure sufficed to set up the decomposition.

Hydriodic Acid.—The aqueous solution of this acid was also employed. On first subjecting it to the action of light no visible effect was produced; but subsequent trials developed a very extraordinary one. A family resemblance pervades the nebulae of hydriodic, hydrobromic, and hydrochloric acids. In all three cases, for example, the action commenced by the formation of two small clouds united by a cord; it was very slow, and the growth of the cloud in density and beauty very gradual. The most vivid green and crimson that I have yet observed were exhibited by this substance in the earlier stages of the action. The development of the cloud was like that of an organism, from a more or less formless mass at the commencement to a structure of marvellous complexity. I have seen nothing so astonishing as the effect obtained, on the 28th of October, with hydriodic acid. The cloud extended for about eighteen inches along the tube, and gradually shifted its position from the end

nearest the lamp to the most distant end. The portion quitted by the cloud proper was filled by an amorphous haze, the decomposition which was progressing lower down being here apparently complete. A spectral cone turned its apex towards the distant end of the tube, and from its circular base filmy drapery seemed to fall. Placed on the base of the cone was an exquisite vase, from the interior of which sprang another vase of similar shape; over the edges of these vases fell the faintest clouds, resembling spectral sheets of liquid. From the centre of the upper vase a straight cord of cloud passed for some distance along the axis of the experimental tube, and at each side of this cord two involved and highly-iridescent vortices were generated. The frontal portion of the cloud, which the cord penetrated, assumed in succession the forms of roses, tulips, and sunflowers. It also passed through the appearance of a series of beautifully-shaped bottles placed one within the other. Once it presented the shape of a fish, with eyes, gills, and feelers. The light was suspended for several minutes, and the tube and its cloud permitted to remain undisturbed in darkness. On re-igniting the lamp the cloud was seen apparently motionless within the tube; much of its colour had gone, but its beauty of form was unimpaired. Many of its parts were calculated to remind one of Gassiot's discharges; but in complexity, and, indeed, in beauty, the discharges would not bear comparison with these arrangements of cloud. A friend to whom I showed the cloud likened it to one of those jelly-like marine organisms which a film barely capable of reflecting the light rendere visible. Indeed no other comparison is so suitable; and not only did the perfect symmetry of the exterior suggest this idea, but the exquisite easing and folding of film within film suggested the internal economy of a highly-complex organism. The *twoness* of the animal form was displayed throughout, and no coil, disk, or speck existed on one side of the axis of the tube that had not its exact counterpart at an equal distance on the other. I looked in wonder at this extraordinary production for nearly two hours.*

The precise conditions necessary to render the production of the effects observed with hydrobromic, hydrochloric, and hydriodic acids a certainty, have not yet been determined. Air, moreover, is the only vehicle which has been employed here. I hazard no opinion as to the chemical nature of these reactions. The dry acids, moreover, I have not yet examined.

Correspondence.

A PHOTOGRAPHERS' RELIEF FUND.

DEAR SIR,—I think that a serious error will be committed if, in forming a Relief Fund, a spirit of exclusiveness be permitted to govern the arrangements. Some of your correspondents seem anxious to draw a rigid line in defining who may be legitimately styled photographers, and so be properly qualified to claim aid from such a fund. And I notice that in a leader you raise the question whether the "hangers-on" to photography may not possibly be induced to continue in that equivocal position, with a view to the aid such a fund would supply. I think that distinctions between photographers *pur sang* and those of a more hybrid character are inadmissible here. The fitness of a claimant, both as to the extent of his necessities and the nature of his claims, will doubtless be considered by the committee in charge of the Fund; and it is scarcely worth while considering how the benefits of such a fund may be best narrowed until, at least, it is in existence.

Although not a professional photographer, nor one who by any stretch of probability would be likely to need the aid of

* "It is as perfect as if turned in a lathe." "It would prove exceedingly valuable to pattern-designers," were remarks made by my assistants as they watched the experiment. Mr. Ladd, who is intimately acquainted with the phenomena of the electric discharge through rarefied media, remarked that no effect he had ever seen could compete in point of beauty and complexity with the appearance here imperfectly described. I mention this to indicate how the phenomena affected other eyes than mine.

such a fund, I will subscribe a guinea a year.—Your obliged servant,
P.

November 20th, 1868.

SIR,—The plan of your correspondent who is ready to pay in £5, and thinks to make up a fund not less from any person, would be worth the trouble—would, I think, be a bar to making up a respectable fund. How many employes have £5 to spare? But a small portion, I fear. Let the employes subscribe £2 to £5, according to their means, and the principals not less than £5.

For my part, I have a five-pound note ready.—I am, yours, &c.,
W. MATHEWS, Another Old Daguerreotypist.

Bury-St.-Edmunds, November 30.

[We conceive that any committee who may undertake the management of such a fund will regard no sum as too small to accept and duly enter into their accounts. In the list of promises already sent to us there are sums ranging from 5s. to £50.—Ed.]

LUX GRAPHICUS IN DEFENCE.

MY DEAR SIR,—Although the clear and noble defence of your right to conduct your journal on the wise and broad principles you have so lucidly laid down in your article entitled "Amateur Criticism" renders a reply from me almost unnecessary, I will, if you please, answer those questions and remarks which are most directly addressed to me by your correspondent "Lux in Tenebras," and honestly endeavour to throw a little more light on the darkness in which he is evidently enveloped, not reluctant, however, to my real name, but to my reasons for giving the opinions to which he takes exception.

Answering his questions in the order in which he puts them, I assign the following reasons for saying that Messrs. Robinson and Cherrill's group of children was "too suggestive of scissors and paste to be a good picture." Firstly, the figures are too much scattered and detached, in my estimation, to present that appearance of unity and relation which is absolutely necessary in good composition, no matter whether the picture be produced by combination printing or from one negative. Secondly, the boy seated on the right hand side of the picture, and placed against a dark mass of foreground, presented to my eye the appearance of flatness—of being cut out, and laid or pasted on that portion of the picture. Hence the origin of the term I used. It may not have been the softest phrase I could have employed, but, such as it was, it presented itself to my mind while writing the critique, and has the merit, at least, of being outspoken candour. I cordially agree with all that you and your correspondent say concerning the photographic beauties of Messrs. Robinson and Cherrill's picture of the group of children, and had it not been for the defects which I noticed and have described, I would have unhesitatingly pronounced it a noble picture.

The second question which "Lux in Tenebras" puts to me, "Does he mean that scissors and paste are illegitimate aids, &c.?" is best answered by referring him to my comments on Messrs. Robinson and Cherrill's picture of "Returning Home," which picture is produced by similar means, but much more successfully. If "Lux in Tenebras" cannot see as I do, or coincide with my opinions, I do not blame him. He has as much right to hold his own views and give expression to individual judgment as I have. It is such freedom of thought and action that has made photography what it is, both artistically and scientifically considered.

Your other "unknown gentleman" also takes exception to what I said about Mr. Fry's and Mr. Blanchard's pictures, and charges me with "a piece of exaggeration, indulged in to introduce a feeble joke." Granted. The exaggeration was too apparent to escape the notice of the least observant, and the joke was of necessity "feeble," seeing that it was but a dim reflection of a weak original. Jokes are not my "forte points." Nevertheless, what I said of Mr. Fry's pictures was true. With one or two beautiful exceptions they were too white and chalky, possessing a great deal too much contrast. As to their being "the gems of the room" is an idea too absurd to be entertained for a moment. What I said of Mr. Blanchard's works I readily confirm. But, be it understood, that my encomiums

were not unqualified. When alluding to his pictures in my critique I said, "Some of which are quite equal to the French artist's best works," &c. As far as my judgment could guide me I gave, in all cases, a fair and honest criticism, according to my own convictions; neither sparing praise nor condemnation where I thought it was merited. If a critique be made at all, it should be done honestly and fearlessly, without prejudice or bias of any description, and in a spirit of fairness that cannot be imputed to any unworthy motives. Otherwise, if a critique consist of unqualified praise when censure is merited, it would not be criticism, but blind, ignorant, or venal adulation. And as such it should be received, by exhibitors in particular.

In conclusion, I beg to tender my thanks to "Lux in Tenebras" for his outspoken objections to the opinions I advanced. Though he indulges in the practice of what he condemns, he is, at least, fair and honourable in challenging me to fight with my own weapons, which is a much more manly and straightforward course than to use others at random and in the dark, which would be much more likely to strike and injure an innocent friend than wound a supposed enemy.—I am, sir, yours very truly,
LUX GRAPHICUS.

November 30th, 1868.

IODIDE OF MERCURY-INTENSIFYING.

SIR,—A few weeks ago you favoured the readers of the News with an article on intensifying with mercury. That article was doubly interesting to me, as I had during the summer used the process for the first time, and I found several discrepancies in my practice fully and satisfactorily explained. One discrepancy, however, I do not understand, and it is that having produced a negative with the olive tint and put it by to dry, I next morning found it perfectly yellow, whilst three or four more negatives produced at the same time retained their colour. In every case I used a final wash of very dilute hydrosulphate of ammonia, as recommended in the Year-Book of 1867, and it is the absence of this chemical in the article referred to that induces me to trouble you with this letter. May I therefore ask you what part the hydrosulphate of ammonia is supposed to take in the final operation of intensifying, and whether it is better that, when the mercury process is employed, the developing solution should not contain gelatine, honey, sugar, or any such organic substances?—I am, sir, your obedient servant,
AMATEUR.

London, November 26th, 1868.

[It is not customary to apply a solution of hydrosulphate of ammonia when the iodide of mercury intensifying process is used. Some operators apply this solution after bi-chloride of mercury, the object being to produce a film of sulphide of mercury, which is black, or very dark brown, but, as a rule, gives a less delicate negative than the iodide. Where the mercury intensifying process is used, it is not desirable to employ organico-iron developers.—Ed.]

AMORPHOUS ALBUMINIZED PAPER.

SIR,—In calling your attention to this subject, mentioned in your issue of the 13th inst., I wish to say that I had formerly great difficulty in procuring a continuous supply of this very useful paper, till I got a photographic chemist in this town to procure some from Berlin, where it was made expressly for me. I much regret that so useful a paper should be neglected, as its advantage over the simply salted paper is, that it not only produces a more brilliant print, but, what is of more importance for worked-up pictures, the artist can put one wash of colour over another almost as well as on drawing paper.

If any gentleman would wish to know where I get this matt albumen paper from, I should have great pleasure in informing him.—And remain, yours obediently,
JOHN W. BURTON.

3, Haymarket, Leicester, November 25th, 1868.

PS.—I forgot to say that using the back of albumen paper is a good makeshift, but the watermarks are a decided drawback.

Talk in the Studio.

SOUTH LONDON ANNUAL DINNER.—The annual dinner of the South London Photographic Society will be held on Saturday, the 12th inst, at the Salutation Tavern, Newgate Street, at five o'clock. Members can procure their tickets at the regular meeting on the evening of the 10th, or of Mr. How, Foster Lane.

SALE OF POISONS.—We notice that some of the photographic dealers are issuing circulars calling attention to the fact that the new Sale of Poisons Act will come into operation at the end of this year, and recommending photographers to lay in a stock, which they offer, until the end of the year, on favourable terms, after which time they will cease to supply cyanide of potassium, bichloride of mercury, &c., in accordance with the provisions of the Act.

ARTISTIC COPYRIGHT.—At the opening of a new session of the Society of Arts, London, Henry Lennox, in the inaugural address, referred to this subject as follows:—"First, I may allude to the Artistic Copyright Bill, drawn up by the Council, which it is intended to again introduce during the coming session. You are all aware that it was last year introduced by Lord Westbury, but, owing to circumstances which I need not further allude to, it did not pass into law. I believe there is no one belonging to this Society who does not entirely approve of the objects of that bill, which is to supplement the Act of 1862, also the work of this Society, and, by consolidating and amending the laws of artistic copyright generally, to bring this branch of the law into one consistent whole, worthy of the nation, and more in harmony with the laws which regulate this subject in foreign countries. It must also be borne in mind that it is not ourselves only who are concerned in this matter, but also various foreign states, at present thirteen in number, with whom we have conventions for international copyright, and who feel deeply the present defective state of our artistic copyright law."

STUDIO ACCESSORIES.—We have received from Mr. D. H. Cussans, of Southport, some photographs of very excellent studio accessories, such as a posing-chair, cabinet, and table. The designs are very good, and free from vulgarity. We understand that they are free from composition or tinsel of any kind, being manufactured in walnut wood, and covered, where necessary, in Utrecht velvet. The manufacture of this kind of studio furniture is a step in the right direction, and should be encouraged by photographers.

AMATEUR PHOTOGRAPHIC SOCIETY.—At a recent meeting of this Society, notice of which reaches us just as we go to press, prizes to the amount of about £80 were awarded.

PIRACY.—Solomon Alber, a Jew, of 1, Great Prescott Street, Whitechapel, appeared before Mr. Paget to answer 25 summonses taken out against him by Mr. Henry Graves, the printseller and picture dealer of Pall Mall, for pirating copies of the engravings of the "Railway Station," by Frith, "My First Sermon," "My Second Sermon," the "Anxious Mother," and the "Parable of the Lost Piece of Money," of which Mr. Graves possessed the copyright. The defendant was also charged with importing a copy of paintings prepared from the same designs. The penalties amounted to £125. Mr. Graves said the painting and engraving of the "Railway Station" cost him £24,000. He was still in possession of the original, which was not consumed when his gallery was destroyed by fire. After some discussion between the parties the defendant agreed to pay Mr. Graves £70 and all the costs, and to sign an undertaking in writing not to repeat the offence.

A NOVEL PHOTOGRAPHIC GALLERY.—General Grant is coming to New York to spend a week or two. We take the liberty of letting out one of his secrets. He intends to get the photograph of every place-hunter that approaches him, and to send all off to Washington, to be filed in a conspicuous place for his information during the entire term of his administration.—*New York Times.*

NATURAL NEGATIVES.—A provincial journal says:—"Mr. James Thompson, of Glasgow, has contrived a new method of

producing photographic negatives of geological specimens. He saws from the stones thin slices containing fossil remains or other specimens; these, when polished, are so thin and transparent that they may be used as negatives for photographic printing upon the usual sensitive paper. Beautiful prints are thus obtained, having all the fidelity of nature itself.

PHOTOGRAPHS TO MEASURE.—We find amongst the facetiae of a contemporary the following:—"A photographer in Suffolk was recently visited by a young woman, who with sweet simplicity asked, 'How long does it take to get my photograph after leaving my measure?'"

To Correspondents.

NO THEORIST sends a somewhat strongly-worded letter, commenting on the letter of Mr. Fry respecting the use of nitrate of soda in the printing bath, in the course of which he says:—"I have yet to learn that because I cannot give a good theoretical reason for everything I do in photography I am to abandon it. You have often repeated, sir, that practice is a head of theory in photography. If a formula seemed wrong, and yet gave me good pictures, I should stick to it; much more shall I stick to the use of nitrate of soda, the advantage of which I have practically proved for years, seeing that, so far from seeming wrong, I think that a score of good theoretical reasons could be given to show that it ought to be of service in the printing bath." We should have preferred to insert our correspondent's letter in its entirety, as it was sent for publication, but for three reasons: It consists chiefly of assertions and opinions, it is strongly worded, and it is anonymous. Anonymous letters are quite eligible for publication if they contain instruction or reasoning; but anonymously expressed opinions merely, carry no weight with them. If anonymous opinions are unsuitable for publication, they are still less suitable if they are expressed in strong language, addressed against some one who has signed his name to his communication. If a war of opinions were desirable, it would be obviously unfair whilst one writes in his proper person for the other to shelter himself under an anonyne. Take a notorious illustration, familiar to metropolitan photographic circles, of the necessary unfairness and occasional dishonesty of such a case: a person who occasionally writes in another journal, on subjects connected with photography, in his own name, also writes under some other apparently real name, confirming his own statements, and complimenting himself by the application to his first communication of such words as *able* and *honest*; and then generally writes a few anonymous notes, still further supporting the statements made in the article under his own name. Although such a course is seen through, and excites contempt, it deceives some, as it is intended to do. As a general rule, it will be seen that letters of mere opinion possess more value if they bear the writer's name; imperatively they should do so if they make statements or comments affecting the interests or feelings of others. An abstract argument loses nothing by being anonymous, as it should stand or fall by its own force and letters devoted to the discussion of a subject, or devoted to practical matters, need not necessarily bear the name of the writer. Our correspondent thinks he could give a score of good theoretical reasons for the use of nitrate of soda. Why did he not devote part of his letter to their statement, instead of indulging in personal remarks which are smart, but not instructive. We, who have many reasons for approving of the use of nitrate of soda, should have been glad to give them publicity.

LOOKER-ON.—We place the answer to "Looker-on" in immediate contact with that of "No Theorist," because he writes on the same subject, and although with opposite views, yet much of our reply to "No Theorist" is applicable to the letter of "Looker-on." He says:—"Whatever photographers may think of Mr. Fry's condemnation of nitrate of soda in the printing bath, I for one agree with him in regarding it as an abomination." He gives no reasons any more than does "No Theorist," but further proceeds to express approval of Mr. Fry's condemnation of the "high-falutin style" of some writers, and to add further condemnatory comments of his own, kindly giving the Editor some advice as to the proper mode of dealing with the articles of professors of the "high-falutin" school, for which we are duly grateful. Personally, we have a strong objection to "high-falutin," and believe that, in a scientific journal, either a stilted or a flippancy style is out of place; brevity, clearness, terseness are required in writings intended to instruct; but when gentlemen have instruction to convey, there is some degree of fairness in permitting them, within reasonable bounds, to do it in their own style and in their own language.

O. P.—With the exception of the manual of instructions issued by Mr. Hughes, and the second part of the "Practical Photography" published by Messrs. Negretti and Zambra, and our own YEAR-BOOKS, we know of no work containing any extended account of the various dry processes. There is no work devoted exclusively to that subject. It would not be piracy to compile such a work if care be taken that the matter is re-written, or, when any other work is made to contribute, that due acknowledgment be made. Let us know if you contemplate such a step.

W. J. A. G.—Photography in winter is always more difficult than in summer; but in clear frosty weather there is generally some good light. It is desirable to maintain a moderately warm temperature, both in the studio and in the dark room; but it is not necessary to keep it as high as 63°, nor would it be easy to do so. Keep it somewhere between 50° and 60°, taking care, if possible, to avoid a lower temperature than 50°. Use a 40-grain silver bath, and a tolerably strong plain iron and acetic acid developer. As a rule, avoid warming bath and developer much beyond the temperature of the room, and, as a rule, not at all. Use as much light as you can admit, and as large apertures in your lenses as the subject will permit, and give full exposures. White reflecting screens are often useful. Read an article in our YEAR-BOOK for 1867 on Photographing in Winter, which is full of valuable hints. The print you enclose is very good, but a little under-exposed. There is every promise of your success by that process if you persevere; but, so far as possible, use the wet process in winter.

FENIAN (Belfast).—The repeated immersion of coated plates in your bath, and leaving them all night, is most probably the cause of your pinholes. The bath has become supersaturated with iodide of silver, one of the most fertile causes of pinholes. Add to your bath an equal bulk of distilled water (this will precipitate a large portion of the iodide), filter, and then add crystals of nitrate of silver in proportion to the water which has been added. The markings you indicate are suggestive of a damp or dirty plate. Craze markings chiefly arise from excess of water in the collodion, which is scarcely likely to be the case with the sample you describe. It may arise from immersing the plate too soon after coating. Let it set well, and keep the plate in motion all the time immediately after immersion. 2. The maker you mention in question 2 will supply you with a good article, we believe. 3. The washing apparatus you describe will, we doubt not, answer very well.

HYP0.—As a rule, publishers prefer to buy prints rather than negatives. We cannot tell you of any one who, as a rule, purchases negatives. Such houses as Marion and Co., or the London Stereoscopic Company, are the best to apply to.

X. Y.—The lenses you name are moderately good; certainly not equal to those of the best English makers. 2. Your question is scarcely sufficiently definite. In speaking of eight or ten feet of skylight you doubtless mean that amount in length, but you do not refer to the width, nor do you state whether there is to be any side-light, nor how much. Write again a little more explicitly, and we will give our best attention to your query.

J. TURNER.—See article in our last on dirty whites in developed prints. 2. Allow the prints to remain in the fixing bath about twenty minutes. It depends on the size of the print and the quantity of solution as to whether you should use it fresh for each print. It may not always be necessary to have it fresh; but with large prints it is a good precaution to use it so. We have published very full information on enlarging from time to time. If you have the volumes, look through them, and you will find information on every point connected with enlarging. Any special difficulties we shall have pleasure in advising you about; but it is difficult in this column to give general information on any topic.

A. PARRY.—We do not know of any place where silk or linen is sold with an especial view to photography; nor do we think that any special fitness is necessary. Ordinary fine linen cambric, or muslin, and fine white silk will serve. Perhaps some of our correspondents who may have worked in this direction will state whether they have found any especial kind desirable, and where it can be procured.

COLLODION.—The rapid rectilinear is better for out-of-door work and general purposes than the D, the latter better for portraiture; but the first is the most generally useful. 2. Our personal confidence is not shaken in England's process, but the experience he has had shows how imperative is extreme care in manipulation. This is the case in all the dry processes to a much greater extent than in the wet. The results of the last exhibition would suggest the superiority of the gum process, and nothing, indeed, could be better in careful hands; but for general trustworthiness we still believe that the collodio-albumei is the safest. Thanks for your suggestion. We aim to consider the interests of all photographers, professional and amateur, alike; but, as a rule, all that interests

professional photographers is also interesting to amateurs. There is no point and no process interesting to amateurs, that we know of, in regard to which we do not give the fullest information.

H. S.—The oxyhydrogen light is more powerful than the oxycaleium light. You will find very full information on the subject in a pamphlet published by Negretti and Zambra, price one shilling.

VENATOR.—We always recommend the wet process in preference to any dry process, where it can conveniently be used; but the gum plates yield such delicate and rapid results that in the hands of a skilled manipulator they may save much trouble in the class of work you name. 2. Clean rain water, purified by means of a little permanganate of potash, is the best substitute for distilled water. Animal charcoal is not quite admissible as a purifier, as some of the phosphates it contains would be dissolved by the water, and would interfere with the results. Your specimens have not reached us at the time we write. It is not necessary to use fresh water for washing each plate, unless a very small quantity is used.

CARL MEINERTH (Newburyport, U.S.).—Thanks for the specimens and your interesting letter. It is always pleasant to us to receive such long friendly and confidential letters from our readers at a distance. We shall notice the cards shortly; they admirably illustrate the effect of printing in varied degrees of deviation from perfect contact, and so securing varied degrees of the softening effect. It is very singular how jealous photographers have ever been of any of their body attempting to secure his ideas by means of a patent, especially in cases where a special method of definitely producing something is devised, in regard to which some indefinite ideas have been floating about.

THOMAS GULLIVER.—Thanks.

J. MARTIN.—Received.

WM. BLAIR (Perth).—Received, with many thanks. The examples of the simplified processes are very admirable. We shall have something to say upon the subject shortly.

A. BROTHERS.—Thanks.

DR. LIESEGANG.—Received. Thanks.

DR. JACOBSEN.—Received. Thanks. We will write shortly.

J. W. SMITH.—We shall have pleasure in proposing you. You will, on election and payment, be entitled to this year's presentation prints.

H. NEALE.—Thanks. In our next.

OXONIENSIS and several Correspondents in our next.

Several Articles in type are necessarily deferred for lack of space.

Photographs Registered.

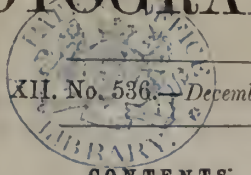
- Mr. J. B. GIBSON, Hexham,
Photograph of Countess of Derwentwater
- Mr. J. COLLINGS, Cardiff,
Two Photographs of Mr. H. S. Giffard.
- Mr. TOLLERTON, Lincoln,
Two Photographs of Mr. J. H. Palmer, M.P.
- Mr. GREEN, Coventry,
Four Photographs of A. S. Hill, Esq., Q.C.
- Mr. W. LAWRENCE, Dublin,
Five Photographs of Prince Edward of Saxe Weimar.
- Mr. H. J. BROOKS, Abingdon,
Photograph of G. Lushington, Esq.
- Mr. W. HECTOR, Crediton,
Photograph of Oakmeur Valley, Devon.
- Mr. DONNAN, Northampton,
Photograph of Mr. Ward Hunt.
- Mrs. H. R. WILLIAMS, Bath,
Photograph of Rev. H. F. Lyte.

. All photographs forwarded to the Publisher for registration receive attention at once; but the pressure on our space sometimes compels us to defer the acknowledgment in this column. It should be borne in mind, therefore, that non-acknowledgment at once does not necessarily imply non-receipt or non-registration.

All Communications for the Editor to be addressed to 15 Gough Square, Fleet Street, London, E.C.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE
Simplified Carbon Printing	589
Warming the Dark Room and Chemicals	589
An Art Critic on the Late Exhibition	589
Copyright in Photographs in America	590
Prints on Approval. By Nelson K. Cherrill	591
Photographic Marking Ink. By H. Neal	592
A Visit to the Photographic Studio of the Imperial Military Geographical Institute in Vienna. By Alois Nigg	592
The Printing Press.—Its Use to Photographers. By Thomas Gulliver.....	593
Dry Plates.—Hints. By M. Carey Lea	593

	PAGE
Means of Equalizing Exposure with Wide-angle Lenses. By John M. Blake.....	594
The Use of Paraffine in Photography	595
Proceedings of Societies—North London Photographic Association—London Photographic Society—Amateur Photographic Association	595
Correspondence—Cleaning the Hands—Photographers' Relief Fund	598
Talk in the Studio	599
To Correspondents.....	600

SIMPLIFIED CARBON PRINTING.

WE were favoured a few weeks ago by Mr. Blair, of Perth, with an admirable selection of examples of carbon printing by the simplified methods upon which he has for some time been engaged in experiment, and in which he has attained a degree of success which gives them the highest interest.

The prints consist of two classes, of each of which we have several excellent examples. The first class, amongst which we have both portraits and landscapes, consists of prints produced upon a tissue similar to Mr. Swan's, but with only a single transfer. Instead of the tissue being mounted on a temporary support for the purpose of development, and afterwards again transferred to the paper which serves as its permanent basis, the tissue here, after exposure, is mounted at once, face downwards, on the paper which is intended to form part of the picture, and is developed and finished upon that paper. Various modes of effecting this end have been attempted before; but in the prints before us Mr. Blair has secured an unusual degree of success. Another interesting peculiarity of some of these examples is found in the fact, that in preparing the tissue, a double layer of colour, of two distinct tints, has been used, which gives to the lighter half-tones a peculiarly warm and pleasant glow. The negatives used in producing the carbon prints with a single transfer are of course reversed or transferred negatives.

Still more interesting than these is another series, in which no transfer whatever is used. Two of these are on plain paper, and two on albuminized paper, and in all of them there is a degree of excellence which presents something considerably more than merely good promise. Although obtained direct without transfer, they possess an admirable degree of half-tone. A "Bit of Quarrymill Dam," a landscape with some fine foliage and water, is a very charming picture. "Marshall's Monument, Perth," is an architectural subject produced without transfer on albuminized paper, a pleasing picture with good half-tone, as, indeed, have all the examples. A portrait by the same process which we received from Mr. Blair two or three months ago was not equal in half-tone to these landscapes. Whether this indicates progress in the process, or its greater suitability for landscape work, we cannot say; but we shall look with interest for further indications of the capabilities of the process, as well as for some account of the *modus operandi* employed in producing the excellent results.

On this score any remarks we can offer can only be conjecture, and we may say at once that, so far as we can see, only two methods would have been available: one, the preparation of a very thin coating of pigment, gelatine, and bichromate, thoroughly rubbed into the texture of the paper, which, on developing, presenting various degrees of insolubility,

according to the more or less perfect action of light, would give some degree of half-tone; but not nearly so much, we believe, as Mr. Blair has obtained here. The other method would consist in printing through the prepared paper, probably after washing the back, to remove the yellow tint caused by the bichromate. Possibly Mr. Blair has some new and improved method of effecting these known operations, or possibly he has a method not dreamed of by others. Certain it is that the devotion of years to the carbon process—and few men have remained more constant to a very early love—has, in his hands, produced most excellent results.

WARMING THE DARK ROOM AND CHEMICALS.

SOME recent enquiries have reached us as to the best mode of keeping the temperature of the dark room and of the chemicals used therein from falling too low during the cold winter months. The best plan much depends on the especial circumstances of each case. For most cases nothing can be better than the heating and ventilating stove described by Mr. Hockin in our last YEAR-BOOK. We may, however, mention a plan of exceeding simplicity and economy which we have recently seen.

It is unnecessary here to enter into any preliminary comment on the injurious effect of extreme cold in retarding photographic operations, or on the importance of keeping all the solutions at one temperature, and that, if possible, not much lower than 50° Fahrenheit. The arrangement to which we refer, which seemed as efficient as simple, was in operation in Mr. Blanchard's dark room, and consisted of a small ring gas burner turned on so as to give a very small flame. As, however, the products of the combustion of gas might be injurious if constantly present in a dark room, Mr. Blanchard had improvised a very simple method of getting rid of them. A large tin funnel was inverted over the burner, and to the small end a piece of tin pipe was attached, and carried out of the window. This arrangement served two purposes: it provided a chimney to carry off the products of combustion, and it concentrated the heat in the neighbourhood where it was required, keeping the nitrate bath, and other solutions all placed near, at a satisfactory temperature. It is probable that a small lamp treated the same way would answer the same purpose.

AN ART CRITIC ON THE LATE EXHIBITION.

IT is sometimes good to see ourselves as others see us, although we may have a profound conviction that "those others" are wrong, and their views shared by few. We subjoin a criticism on the late exhibition in Conduit Street, given amongst the "Notes and Incidents" of the month in

the last number of the *Gentleman's Magazine*. It runs as follows:—

When the photographic fever was at its height, and every hobby-rider was buying cameras and dirtying his fingers with silver solutions, exhibitions of sun-pictures were of as regular recurrence as those of the painter's productions. But as the fever subsided, the shows lost interest, and were discontinued. Now they have been revived on a modest scale, the London Photographic Society having last year and this invited the artists to send specimens in an informal way, to make a collection for a *conversazione* exhibition. The walls of the Architectural Societies' rooms in Conduit Street were thus richly covered on the 10th of the past month, and an opportunity offered for forming a tolerably fair estimate of the progress that eight or ten years have wrought in the light-painter's art. This is less than might have been expected. The majority of the specimens shown were portraits; landscapes were few, and of no higher merit than many produced a dozen years ago; this branch of photography has remained at a standstill. But the portraits were far in advance of older works; manipulatory details having been mastered, artistic matters have come in for attention; posing, lighting, accessories, and the score of trifles that are necessary to approach perfection, have in turn been studied, and the effects are very marked. Further, a new master of portrait art has arisen, M. Salomon, whose exhibits in this line at the French Exhibition astounded and abashed the photographers. They went half-crazed about him: invaded his studio, brought him to England, studied his methods, puzzled out his secrets—such as they were, mere exercises of a master mind—and in the end have done their very best to imitate him. Half the portraits in the Conduit Street show were Salomonised: some of the imitations were successful, others were almost parodies of the Frenchman's system. The peculiarities of M. Salomon's art are chiefly the introduction of masses of dark drapery, deep backgrounds, with few accessories; and here lies the main secret—the use of brain in every part of the process. He has, too, abolished the white mounting hitherto universal, and surrounds all his pictures with narrow gold borders, placed, if necessary, in larger frames. Every secondary point is made to retire to give prominence to the leading one—the face of the sitter. How this matter has hitherto been neglected by photographers every one knows. When we have noted the effects of this Salomon influence, we have noted the chief novelty of the exhibition. But we ought not to omit mention of the laudable attempts to make ideal pictures which some of the more ambitious artists displayed. These, as usual, were beautifully executed, and very pretty, but they missed their mark, as such productions must always do. A picture that is anything else than a mere portrait must bear the impress of a soul, and there is no soul in a photographic camera.

Precisely so: a true picture must bear the impress of a soul, and there is no soul in a photographic camera. Of course there is not, any more than there is in pencils and palette, or in chisel and mallet. But are no pictures produced by soulless pencils?—no sculpture by soulless chisels?

"But the artist who employs them has a soul which he impresses on his work."

Precisely so, once more. It is the artist whose soul must impress the work, not the artist's tools; and the camera is the artist's tool, when an artist chooses to use it, exactly as are the pencil and chisel: a tool somewhat less controllable, working in materials somewhat less plastic, and therefore making the triumph the greater when it is achieved. The successor of *Sylvanus Urban* repeats the same old story, which has been refuted a thousand times, in which he mistakes the artist's tool for the artist, and apparently fancies that pictures are ground out of a camera like tunes out of a barrel-organ. But if this were so, whence the "use of brain" to which the critic refers as the source of Adam-Salomon's success?

COPYRIGHT IN PHOTOGRAPHS IN AMERICA.

ENGLISH photographers have not unfrequently expressed dissatisfaction with the working of the Copyright Act in this country, so far as it relates to photographs. A consideration, however, of our own laws and those of the United States in this respect will probably tend to satisfy our readers that they are highly privileged when compared with their American brethren. We condense from the *Philadelphia Photographer* an account of an important case which has just terminated unsatisfactorily for the photographer, and in the course of which the old, stale fallacies as to the inferior

and mechanical character of photography are revived, and made to do duty for arguments:—"The action was brought by Mr. F. Gutekunst against Messrs. Weise and Co., lithographers, of this city, to recover damages for the violation of the copyright of his photograph of General Grant. Mr. Gutekunst had duly entered his title in the court office as required by law. The next step was to impress upon the face of the photograph that he had made the entry and secured his exclusive title. The Act of Congress requires that this notification shall be upon "the respective copies of every edition," and "upon the face thereof." Instead of scratching this imprint upon one corner of the negative, so that every impression should necessarily present the information of the copyright, the notice was, as usual among the fraternity, printed upon the card-board. The print could, therefore, be floated off from the card-board, and then it would be without the copyright notice, and the card bearing that notice would be ready to receive any other print. Judge Grier decided that, under the Act of Congress, it was for the jury to decide as a matter of fact whether the notification was impressed upon the face of the photograph, and, of course, the decision was necessarily against Mr. Gutekunst."

From this it would seem that to obtain any chance of protection a card picture would require to be defaced by having printed on the picture itself the name of the photographer, the date, and an intimation that the picture has been duly entered according to the Act of Congress.

Our contemporary further points out that even if the proper precaution had been taken, it seems very doubtful whether the United States Copyright law would protect photographers; and he quotes the argument of the counsel for the defendant to explain the difficulty. Photographers will read with a little surprise the remarks of this gentleman, M. Constant Guillou—made, it is true, as an advocate on behalf of his client—when they are informed that he is an able amateur photographer, and was recently president of the Philadelphia Photographic Society. He states that the Act of Congress under which photographic copyright is supposed to be obtained is based upon the following clause in the *Constitution*:—"Sec. viii. Congress shall have power to promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries." M. Guillou remarks in relation to this as follows:—"A photographer in the usual exercise of his profession, employing the ordinary instruments and known processes, is certainly no 'inventor,' and has no claim for a 'discovery': it is equally clear that he is not an 'author,' and his negative is not 'writing.' Congress has power to grant exclusive privileges only to authors and inventors—to no one else; and as a photographer is not in either of these classes, Congress has no power to pass an Act giving him such privilege. If there was no such power, then the passage of the Act was unwarranted, and the law is null and void."

It is not necessary that we should discuss the question here. Whenever it arises for absolute decision capable champions of photography will doubtless be found amongst our American brethren; but we remark, in passing, that, according to every comprehensive construction of the word a photographer is an "author." Not only does the common use of the word, to indicate a producer, justify the comprehensive application, but its derivation leaves no doubt of its fit use to describe not simply the writer of a book, but also the contriver of a thing, and its especial fitness to describe the producer of a photograph. Our Philadelphia contemporary well adds:—"Is there no *invention* in posing a figure gracefully and manfully, and in lighting it so as to produce a likeness and a work of art? Should he have no credit or protection for this? Where does the skilful photographic artist get his attitudes that attract and please so much? He *invents* them. By whose method does he produce such charming effects of light and shade? By those of his own invention. The sun does all this, says the

learned counsel in his argument, *not the photographer*. May he not say with equal force, that the water saws the fanciful scroll-work from the solid piece, and not the slender blade guided by the hands and the inventive brain of the skilful workman? or that steam weaves the brilliant-coloured threads into beauteous patterns, and not the intricate machine produced from and by man's inventive genius?"

PRINTS ON APPROVAL.

BY NELSON K. CHERILL.

How can a portrait be more utterly condemned, than by being "not approved of"? It matters not how artistic the pose may be; it matters little how good the *picture* may be; it matters absolutely nothing how good the *photograph* may be; if the *portrait* is not approved of, its condemnation is complete; and if a picture is condemned, who is to blame—the sitter, or the artist? Certainly, in nine hundred and ninety-nine cases out of a thousand, not the sitter. The sitter usually comes and places himself or herself for the time quite at the photographer's command; the sitter will, as a rule, obey orders (if the artist knows how to give them), and if not, the photographer has the simple recourse of objecting to proceed with his work; so that almost invariably failure must be laid, not at the door of the victim, but to the charge of the unskilful executioner.

It is to be confessed that some faces are easier to take than others, and that some persons are more capable of being managed than others, and so often make better pictures, as well as better portraits; but even the most difficult to manage, and the most ugly to look upon, have some phases of action, or expression; which, if not decidedly elegant or pleasing, are at any rate, very much better than any other; and in these cases it becomes the chief part of the photographer's duty, first to find, and then to draw out by conversation and manner, the most excellent characteristics of the model. No man, however great his practice or skill, can always do this at first sight; indeed, with the majority of men, it is a matter of long study to see anything at all, much more to see the whole so perfectly as to accept the good and reject the bad. For this reason, if for no other, photographers should only be too glad to have an opportunity of taking the portraits of their more difficult customers over again a second, or even a third time. And if by this trouble a picture is obtained which is perfect as a work of art, and as a faithful portrait of the sitter, surely it is worth all the labour; and even if never paid for, such work must in reputation more than make up for the loss of time and trouble it has taken to produce it. To take a successful photographic portrait is a much more wonderful thing than many people seem to think. Persons who have known each other, and who have been constantly in each other's society for a long course of years, naturally know infinitely more of each other than those who meet only for a few minutes only once, perhaps, in the course of a lifetime; and yet the photographer is often blamed if, after five minutes' conversation with a person whom he has never before seen, he cannot call up in the portrait he produces the very best expression ever seen, by even the most intimate friends of the sitter. What, then, can the photographer do but try again? He may find with some sitters no cause to be ashamed if the specimens are "not approved."

There is, therefore, I conceive, no reason, so far as the art considerations of photography are concerned, why prints should not be sent "on approval"; but there are, I imagine, the very strongest reasons, on the other hand, why pictures should be sent out in this way. The public has a right to be its own judge as to the excellence of portraits for which it has to pay, and therefore no photographer can complain, with any show of justice, if his pictures are required to pass the ordeal of public approval. There is no photographer in the world, however high he may rank as an artist, who is, on any rate ought to be, above having his

pictures "approved" of; he may refuse to take them again, but he cannot refuse the public the right to judge them.

The case is just this: a man wants his portrait taken; he goes to a photographer, and asks him to take him; he looks at specimens, and decides the general style in which his picture shall be executed. He is taken; the proofs are sent home. Now, if these proofs are not considered good, there are, it seems to me, only three positions left for the photographer to choose. He can first (and, if a wise man, he probably will) say he is very sorry, and if he may have another try he will do better next time, and so on (for half an hour if necessary); or he may, if of an abrupt temperament, at once give his customer "the lie direct," on which, of course, legal action will be taken, and the whole profession be put to disgrace. An intermediate course is also possible, and some will adopt it, by saying, "If you do not like the pictures, I am sorry; as, however, I am the best photographer in the world, and as you are a very plain-looking man, I tell you (*entre nous*) you cannot get anything better; if you will have these, well and good; if not, good morning!"

The wrangling between a photographer and his discontented customer may in a measure be likened to the quarrel between Touchstone and the courtier in respect of the latter gentleman's beard. With a slight adaptation it would read thus:—

Touch. I did dislike the taking of a certain photographer's pictures. He sent me word, if I said his pictures were not well done, he was in the mind they were: this is called the Retort Courtous. If I sent him word again, They were not well done, he would send me word, He took them to please himself: this is called the Quip Modest. If, again, They were not well done, he disabled my judgment: this is called the Reply Churlish. If, again, They were not well done, he would answer, I spake not true: this is called the Reproof Valiant. If, again, They were not well done, he would say, I lied; this is called the Countercheck Quarrelsome; and so to the Lie Circumstantial and the Lie Direct.

Jaq.—And how oft did you say his pictures were not well done?

Touch.—I durst go no further than the Lie Circumstantial, nor he durst not give me the Lie Direct; and so we measured words, and parted.

Jaq.—Can you nominate in order now the degrees of badness in photographs?

Touch.—No, by no means; it is a thing past my comprehension.

I do not think, however, that photographers and the public often quarrel about pictures, both parties fighting rather shy of any such proceeding; but there is constantly in the mind of inferior photographers the idea that the public would like to swindle them if it could. They seem to think that when pictures are not approved of, it is from some underhand design of getting a certain number of proofs for nothing; but this will not stand a moment's reasoning; the public is not so fond of having its portrait taken that it will reject pictures unless they are absolutely too bad. There are, indeed, many people who would sooner put up with a bad portrait than have the trouble of sitting again. And if the photographer has his wits about him, he can at all times recover his rejected specimens, on the simple plea that he does not care to be represented by pictures which are not approved of.

We make a regular system now of having a "day-book" specially for specimens, and every one that is sent out is charged at a very high price, and this entry is not cancelled till the pictures are returned, either as ordered, or as not approved of. In the latter case, when the pictures are taken again, the new proofs are also entered in the specimen day-books when sent out, and by this means a most perfect check is given as to the number of pictures out on approval, and the number returned, and so on.

PHOTOGRAPHIC MARKING INK.

BY H. NEALE.

THE following method of marking or producing designs on linen, &c., which I have long been going to send you, and although, perhaps, known to some of your readers, I cannot remember having seen published, may be of service to many. Proceed thus:—Make a 20-grain solution of ammonia nitrate of silver by the usual method, adding sufficient gum mucilage to make it flow better from the pen. Damp slightly the linen or other fabric with a solution of pyrogallol and citric acids (the ordinary redeveloping solution); let dry; then, with a quill pen and the silver solution, trace the design on the linen. The effect seems magical, as the instant the design is formed—in fact, as fast as the pen goes—the design appears of a rich black colour, and is perfectly permanent, requiring no fixing, and will bear any amount of washing.

The above idea might probably be utilized in block printing on linen, &c., as designs could be produced as quickly as by the ordinary printing press.

A VISIT TO THE PHOTOGRAPHIC STUDIO OF THE IMPERIAL MILITARY GEOGRAPHICAL INSTITUTE IN VIENNA.

BY ALOIS NIGG.*

HAVING recently occasion to pay a business visit to my friend M. Frank Pink, the Assistant-Director of the above-named establishment, during the ordinary working hours of the department, it was my good fortune to obtain permission to witness the mode of operating pursued at this deservedly-celebrated photographic studio. This favour I appreciated the more fully from the knowledge that an indulgence of the kind is rarely granted to strangers, on account of the hindrance to work which such a proceeding generally involves.

The establishment is under the careful direction of Lieut.-Colonel Johann Schopf, and the excellent work which has been produced therein has acquired for it such a reputation that no laudable commendation is necessary on my part; at the same time, notwithstanding the high character of the studio, I believe that there are some among my colleagues who do not at all envy me the opportunity I have enjoyed; more especially, I would mention, those gentlemen who are not accustomed to the manipulation of large plates, and those, likewise, who, with the most anxious care, tenaciously hold fast to the methods of operating with which they first become familiar; for in this establishment those orthodox rules and regulations which are generally considered indispensable to proper manipulation, and an infringement of which would, to many minds, inevitably bring about the most disastrous consequences, are simply regarded as null and void; and it would seem almost as if even the chemical reagents had been placed under military discipline to obey in all things, and in no way to disregard, the commands or wishes of the operator.

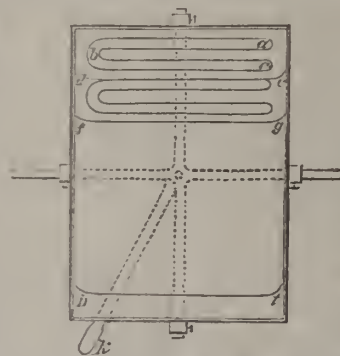
As regards the situation and construction of the different work-rooms, they have all been arranged and built according to the necessary requirements; such, in fact, as could only be the case with a government institute. In an exposed and isolated position upon the roof of the building is constructed the studio, lighted from all four points of the compass. Here the negatives are taken from the original maps and drawings, which are screwed in an upright position to movable frames, placeable against any of the walls of the studio. The top and side-light windows are removable, so that work may be performed, if necessary, in the open daylight, or even sunlight, which streams uninterruptedly upon the object to be reproduced; white reflecting screens may likewise be used on the two opposite sides from those whence the light enters, to prevent the casting of any shadow by the roughness and texture of the paper, an

effect which often occurs when the surface of the object is strongly lighted.

The giant camera stands upon a table capable of being lengthened out or shortened, and provided with iron rollers running upon rails; by this means a picture of any size may be sharply focussed in an incredibly short space of time by a couple of assistants who have had some experience in working together. I am a great stickler at military discipline and working by word of command, but if such satisfactory results were always produced by its means as those shown at this establishment, it is, I think, to be regretted that a certain amount of soldierlike character cannot be infused into every photographic studio. I had the pleasure of personally witnessing the process of copying a map of the same size as the original, which was a drawing composed of four sheets of paper, and the whole operation conducted in such an efficient and original manner that I cannot refrain from giving a detailed description of the same.

A sheet of plate-glass measuring from twenty-five to thirty inches, and roughened all round the margin to the extent of a quarter of an inch by means of a flintstone, was placed upon a frame in the form of a cross, which was supported on a movable socket exactly in the centre. At all four extremities of the cross are clamps, which, being packed together, fasten the plate down, and, at the same time, keep it in the centre of the stand in perfectly horizontal position. By means of an arm fitted underneath the cross, the same may be depressed or elevated at will, so that the glass plate may be turned or tilted in any way without being touched. This description of cross has been used by many photographers for the manipulation of small plates, and I do not allude to it, therefore, as any special novelty: the manner, however, of applying the collodion is, I believe, a perfectly new one.

M. Pink seated himself comfortably to perform this bold operation, pulling sideways towards him the horizontally-swinging plate, and pouring the collodion thereon from a half-pound measure in a thin stream, in the manner indicated by the



lines *a, b, c* in the accompanying sketch. He commenced at the furthest edge of the plate, and allowed the stream of liquid to fall in a parallel line to the same, about two inches distant, tracing a horse-shoe figure backwards and forwards with the collodion. As soon as the latter, by means of a little skilful handling, had been made to spread itself over the plate to the extent of

a hand's-breadth, as shown by *d e*, the operation was repeated in the same manner at a more advanced part of the plate at *e, d, g*, and the collodion so manipulated that it extended to and combined with that previously poured on; in this way the plate was coated until there remained but a margin of about three inches uncovered, as shown at *i h*. Under those corners of the plate which were still dry, vessels were placed for the reception of the superfluous collodion, and the cross-stand was next very slowly and carefully tilted by means of the handle in such a manner that the material flowed evenly over that part of the plate which was yet uncovered. From the commencement of the operation of collodionizing the plate until this moment a period of not less than six minutes had elapsed, and until the material had set sufficiently to allow of the plate being placed in a perfectly upright position at least ten minutes had gone.

The coated plate is now placed in a horizontal sensitizing bath, the collodionized surface uppermost, and allowed to remain therein quietly for a quarter of an hour. It is stated that the plate should never remain immersed in the bath for

* Photographische Correspondenz.

a longer period than twenty minutes, as otherwise the iodide of silver formed becomes dissolved to too great a degree. During the time required for sensitizing, the object to be reproduced is placed in position, and focussed ready for operating, all of which can be undertaken during the interval.

M. Fink concealed himself behind the black cloth which covers the ground-glass of the camera, and then gave the words of command to his assistants, posted at the frame containing the original drawing or map to be copied, the following orders being called out at different intervals:—"To the right!" "Halt!" "The bottom more forward!" "Halt!" "To the left!" "Halt!" "Again!" "All right!"

I was astonished at the rapidity of the manœuvres, and of the appearance upon the focussing glass of the faultlessly-straight lines and sharply-defined image, depicted of the same size as the original, which, in order to produce such an effect, must have been placed in position with mathematical correctness. The institute possesses for this description of work a three-inch lens of Dallmeyer's, which is almost exclusively used for the purpose, and which fulfils the necessary requirements of equal distribution and sharpness in the highest degree.

The exposure which took place in my presence was, by reason of the unfavourable state of weather, a somewhat long one, lasting five minutes and a quarter; in a good light two minutes only is required; while in the sunshine the duration of the exposure is but half a minute.

The same degree of novelty and originality exhibited by the application of the collodion was displayed in the development and fixing of the plate, these operations being conducted in a manner which was perfectly new to me.

In the middle of a sufficiently large receptacle there had been constructed a raised, somewhat convex, and rounded wooden ball, resembling in appearance the buffer of a railway carriage. The plate was placed crosswise upon this rest, being held at one of the corners, that side of the glass furthest from the operator being depressed somewhat; the developing fluid was then poured from a vessel—which, to my thinking, was scarcely large enough for the purpose—close along the upper margin of the plate, from right to left, and allowed to flow downwards over the surface. I observed the liquid flow slowly towards the lower edge of the plate in disconnected streams, and, more slowly still, by careful tilting to and fro of the negative, finally spread equally over the whole surface, until gradually a clean picture was developed, to the certainly unexpected astonishment of your humble servant. The word "Intensifier!" was uttered, and the assistant immediately handed a vessel containing citrate of iron, with which the same process was gone through as with the developer. "Water!" is called for, supplied, and the plate therewith washed. "Soda!" A hand reaches out the fixing agent. "Water!" Here it is. "Mercury!" One hand takes away the empty vessel, while another supplies the required solution.

The treatment with the bichloride of mercury is the same as that pursued with the iron developer; the same divided streams are allowed to flow heedlessly over the picture, forming long, inky-black streaks. "Will not these stains destroy the negative altogether?" I asked. "They will soon become equalized," was the curt reply of the operator; and, so saying, he rapidly turned the plate round, and poured on the liquid from the opposite end; the negative was then lifted up and examined by transmitted light, and afterwards again treated with the mercury solution, the latter being allowed to rest for a short time on any parts where the film did not appear to be sufficiently intense. "Water!" was then ordered. "Water over the hands!" "Wash the back of the plate!" And the finished negative was then placed in my hands for inspection prior to its despatch to another part of the building.

If it had been my express desire to produce a negative of the most fogged description, it would, perhaps, have been

possible for me to have performed the different manipulations with the same nonchalance and disregard of all established rules and precautions; and I must frankly avow, that I deemed it an impossibility, by such means as I have described, to produce a negative without the presence of innumerable spots and blemishes. I was therefore already beginning to congratulate myself on being able to point out the evil consequences inevitable to such an extraordinary manner of carrying a photographic process. But, notwithstanding the most diligent and searching examination, I was unable to discover therein any faulty appearances whatsoever.

(To be continued.)

THE PRINTING PRESS.—ITS USE TO PHOTOGRAPHERS.

BY THOMAS GULLIVER.

HAVING had one in use for several years, and found many advantages from the possession of one, I venture to recommend the addition of a printing-press to the usual stock of apparatus to be found in a photographic establishment. It need not be an expensive one, only such a one as would work off a neat circular, small handbill, list of prices, bill-head, carte-de-visite mount for landscapes, &c., &c.

I may be told that all this is a printer's business, not a photographer's; but it often happens that said printers have a large job on the press that they must work off first; and printers object to take small orders, for if you want only a hundred bills or cards, you will be strongly advised to have two. Now the press I have has cost only £3, and the type, &c., about £4 more, and it is surprising what can be done with this small outlay.

The press in question is of the kind called the people's printing-press, and the type can be had at any of the London type-founders. The working of it is easily acquired, and it serves as an agreeable change after working in the studio among the chemicals. Two or three lessons from a practical printer will be as well when beginning, as starting the right way at first is half the battle won. Some little difficulty will no doubt be experienced with the ink roller, which, like the nitrate bath, in some hands is always getting out of order; but by keeping mine in a close, air-tight box, I have used the same roller without renewing for over three years. I enclose a specimen of my work done on my little press; this was set up and worked off after tea one dull day, and the type washed and distributed before breakfast time next morning.

DRY PLATES.—HINTS.

BY M. CAREY LEA.*

Washing before Developing.—The systems of operations used by different photographers vary a good deal. The plates may either be moistened with weak alcohol and washed, or be simply washed, or be thrown into a developing bath without any washing.

This last plan, which is certainly the least trouble, may be used with some plates with impunity. But I have observed that where any sugar has found a place in the preservative solution, a good washing is needed to get rid of it; otherwise there will be a tendency to irregularity and spot-tiness in the development. When an acid pyrogallie development is used, this tendency is materially less than with the alkaline. When a preservative solution is used with as much as twenty grains of sugar to the ounce, an alkaline developer used without previous washing off sets up a sort of repellent action, and may even collect in pools, developing unequally, and spoiling the picture.

The best conclusion is, therefore, that although a previous washing is not always necessary, it is best and safest to apply it. The foregoing applies, of course, to developing in a pan; if the plate is developed in the hand, on a holder,

* Philadelphia Photographer.

or on a levelling-stand, the developer cannot be got evenly over it without previous moistening; and in such a case, if the preservative has contained sugar, not a mere moistening, but a careful washing will be advisable.

Dark Slides.—When plates are exposed at home, the chance of accidental exposure is very slight, and the loss of a plate not very important. It is far otherwise, however, when a plate is carried many miles: the danger of accidental exposure is greatly increased, and the loss of a plate much more annoying. When a number of dark-slides are rolled up together in a cloth, and taken in a carriage to a distance, they move somewhat, and rub against each other. Perhaps the button works round in this way, and lets the door open a little, or a shutter works by degrees, so as to let in a crack of light. Again, in drawing out a slide from the bundle, the button may catch and open, or may open the button of another slide adjoining, or a shutter may be a little withdrawn.

I have found the following arrangement very convenient and useful to avoid these troubles. To keep the shutter from accidental moving, an ingenious little catch has been contrived for me by Mr. Peace, of this city. A piece of brass, about one and a quarter inch long, and three-tenths wide, is bent across. A hole is drilled through the short part, and notch at one end of the long part. A screw passed through this hole secures it to the end of the slide close up by the shutter. Into the thick end of the shutter a pin is driven, which goes into the notch, thus locking the shutter most securely, and removing all danger of accidental exposure by sliding or disturbance of the shutters.

To prevent opening of the door, I have an extra button placed at the side. It thus becomes extremely improbable that both the buttons will be disarranged on any one slide, and with these precautions the plates may be considered as absolutely safe. The buttons placed on slides for ordinary home use are put on the door, turn under a bent wire on the edge of the frame, and have their other end turned up and rounded, in order the more easily to be taken hold of. This arrangement, convenient enough for the use for which it is intended, becomes a great nuisance if the slides are carried out. Slides for such use should have flat buttons only, and these should be placed on the frame, and not on the door. A screw at one end secures them to the frame, and they will round so as to pass over the edge of the door.

Roughing the Edges of Plates.—In the collodio-bromide process the collodion is, of course, somewhat thicker than in the ordinary modes, by reason of the bromide of silver held in suspension, and, therefore, a little more care is necessary in coating. If the filing of the edges of the plate has been carelessly and roughly done with too coarse a file, it may happen that deep notches will be made, and that the plate, after coating, will show irregular bands running down an inch or more into the plate, alternately thicker and thinner. These will show, of course, in the negative, as where the film is thicker it will develop more strongly. Such plates will, of course, be failures, and the appearance of such bands as I have described may be traced with certainty to careless roughing. In fact, it may be doubted whether any filing or roughing of the edges whatever is needed with dry plates, as these should always be edged with india-rubber benzine varnish, or have a substratum of dilute albumen.

Blistering.—In all dry processes in which albumen is used in the preservative applied to collodion films, there is a tendency to blistering. This blistering depends upon osmotic action. Liquids containing certain substances in solution have an extraordinary power of forcing their way through membranes, and many kinds of artificial films are capable of acting in this respect like natural membranes.

The nature of the cotton used has much to do with this blistering; some collodions blister much worse than others, some during development, some only in the fixing and subsequent washing.

It has seemed to me that the addition of sugar to the preservative, in the proportion of about 10 grains to the ounce,

had a tendency to diminish this evil. I suppose its tendency to be to keep the collodion film in a more porous condition, and so to allow the liquid which has passed in to escape again. The film, when just made, and still moist, is in a very plastic condition, and has not undergone the powerful contraction which takes place in drying. If, whilst in this soft and plastic condition, its pores be filled up with a preservative containing a substance like sugar, the sponginess of the film seems to be better preserved, and, when wetted again, it returns more to the state of an ordinary wet plate than is the case with dry plates made without sugar in the preservative. In some cases this quality is very valuable; other forms of dry plates do not need it.

But I wish to place on record here the opinion that the action of sugar in the preservative is to keep the film in such a condition that, on wetting it, it will return to nearly the condition it had when it left the bath, and especially that by adding sugar to a preservative, and then washing it well out before applying the developer, the development will always take place with much greater rapidity than if the sugar had been omitted: not in the least that the sugar gives enhanced sensitiveness, but that its function is to fill up the pores, keep the film spongy, and, on its removal, to leave it in such condition that the developer penetrates instantly, and acts at once on every particle that has been impressed by light.

MEANS OF EQUALIZING EXPOSURE WITH WIDE-ANGLE LENSES.

BY JOHN M. BLAKE.*

THE effects of the inequality of exposure over different parts of the sensitive plate, when using a wide-angle lens, are well known. The gradual diminution of light, as we pass from the centre to the borders of the plate, may give, in our collodion film, all gradations from an over-exposed negative where the light is at a maximum, to a well-exposed ambrotype at the extreme limits of the field.

This difficulty can be to some extent overcome by giving the best average exposure to the whole field, and shading the borders of the plate in printing; but we thus sacrifice other important points, and imperfectly accomplish our object.

Let us now consider the various causes which tend to diminish the amount of light as we go from the centre of the field. I will mention five.

First, and most important, the increasing distance of the plate from the diaphragm.

Second, the oblique position of the diaphragm to any but the central portion of the plate.

Third, the obliquity of beams of light towards the limits of the field, causing them to spread over more surface than their square section.

Fourth, loss by reflection from the surface of the wet film before reaching the sensitive particles below. This increases in amount as the incident rays make a less angle with the collodion surface.

Fifth, loss by interference of light, which may be supposed to increase in some ratio to the whole amount passing through the diaphragm, as the latter becomes in effect narrowed by its increasing obliquity.

From the first cause the light will vary as the square of the cosine of the angle included between lines drawn from the diaphragm to the centre of the field, and to any point at which we wish to compare the illumination with that at the centre. From the second and third causes the variation will be as the cosine of the same angle in each case.

The variation from loss by reflection must be determined by experiment. The light reflected would probably exceed that from water alone, owing to the greater density of the silver solution.

The loss from the fifth cause is probably of little account, except when using a very small diaphragm, or with a lens of very wide angle.

* Philadelphia Photographer.

Combining the first three causes, and giving the result in a convenient form, we have, the intensity of light at the borders of a field, including a given angle, is to that at the centre as the fourth power of the cosine of half this angle to one; and we deduce that at the limits of a field of $81^{\circ} 6'$, the light is one-third that at the centre; of a field of $65^{\circ} 32'$, one-half; of $52^{\circ} 6'$, two-thirds; and of $37^{\circ} 56'$, four-fifths.

This result is about what we would have expected from the appearance of an under-exposed plate after development. Such being the case, we cannot expect to obtain the highest degree of perfection in detail over the whole surface of a wide-angle picture, unless we adopt some plan for properly equalizing the exposure.

It occurred to me, about the time of the first appearance of the Harrison globe lens, that any sort of approximation to equal illumination of field it might possess, must be due to the use, either by accident or design, of a kind of crown glass, partially obstructing actinic light. As the crown lenses are much thicker at the centre than towards the edges, the effect would be to retard chemical action near the centre of the sensitive plate to a degree depending on the kind of glass selected. The flint lenses in the combination, although thickest at the edges, probably do not have an appreciable contrary effect on the distribution of the light, since this kind of glass is usually whiter than crown.

Not having an opportunity to examine and use a lens of this kind, the matter was forgotten for several years, when the subject was forcibly recalled to mind by the appearance of negatives taken with a Zentmayer lens.

Some preliminary experiments were made with thin wedges of coloured glass placed over sensitive paper, and a kind selected which, at the thickness of the centre (about $\cdot 03$ inch) of one of the lenses in the Zentmayer combination of the size it was proposed to construct, obstructed two-thirds of the actinic light.

At this time another plan was thought of, which could be more easily tested, and did not have certain disadvantages inherent to the first. Thus, if we intend to use our lens with the full angle only, at the best there will be an unnecessary loss in that portion of light passing near its edges, over what would be transmitted were the lens made of the whitest glass. And, again, if, as is often the practice, we wish to use our lens for a smaller plate than it is capable of covering, we will find it seriously and needlessly injured for this purpose, as regards quickness of working.

(To be continued.)

THE USE OF PARAFFINE IN PHOTOGRAPHY.*

PHOTOGRAPHERS are not generally aware of the value of paraffine in their business. Its more general use has probably been retarded for the reason that it is difficult to find a good article of it in the market. That which is best is very hard—so hard that the finger-nail can barely make an impression upon it. When it can be found of that kind, it makes an excellent preservative for prints, and can be safely used as such. If the softer kinds be used, they are apt to turn the print yellow, and aid in its destruction rather than otherwise. The reason of this is, says Professor Bottger, that when melted and exposed to the action of the air, oxygen is absorbed, and the melted fluid becomes brown gradually but surely. So much care need not be taken, however, in selecting paraffine to be used for coating the various articles of wood used in photography, although the best is the best.

In a letter to us some time ago, our esteemed co-worker, Mr. Charles Waldeck, writes:—"I think paraffine can be of great use to photographers. Nothing surpasses it to coat wooden dishes with. I prefer such dishes to hard rubber, porcelain, or photographic ware. A good coating of paraffine for the inside, and two or three of white-lead

paint on the outside, will make a wooden dish perfectly water-tight. A very good silver bath-holder may be made in the same way. The dish or bath is well warmed, the molten paraffine poured into it and made to move all over the inside surface. Then, if possible, if the vessel be put in an oven just hot enough to keep the paraffine melted, it will penetrate more deeply in the wood, and improve its water-tight qualities. Plate-holders made of wood, without glass or composition corners, by being put in the molten paraffine, will for ever after refuse to absorb the silver, and will never produce stains. Manufacturers of camera-boxes would do well to consider this; and all of the wood-work of the camera-boxes would be improved by immersion in this useful protection. A camera-box made of dry wood, as it should be, and well coated in this way, would never warp or corrode by the nitrate of silver. If I ever go on another tour to the Mammoth Cave, I shall previously coat everything I use, made of wood, with it. In coating an object, it should be observed that the *hotter* the paraffine the more perfectly will it penetrate the wood."

In our experience, we have found one objection to the use of paraffine for coating the inside of the nitrate bath. Except with very careful manipulation, the corners of the plates are apt to remove particles of it, which, floating in the bath, cause pin-holes, or adhere to the film. For the other purposes named, however, its advantages cannot be overrated.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Society was held in Myddelton Hall on the evening of Wednesday, December 2nd, Mr. W. W. KING in the chair.

The minutes of a previous meeting were read and confirmed, after which Mr. Tilly, Mr. Jewell, and Mr. Newbury were elected members.

Mr. W. BEDFORD exhibited a couple of very fine 12 by 10 landscapes, which were, he stated, printed on the back of albuminized prints, as had been recently suggested in the PHOTOGRAPHIC NEWS. The prints were rich and vigorous, and excellent in colour.

A conversation on the subject followed, in the course of which Mr. BEDFORD explained that the prints were treated with Mr. Thomas's encaustic paste, which answered well, and gave great richness to the shadows.

Mr. WHARTON SIMPSON exhibited some prints, by Mr. Carl Meineth, he had received from America. The prints were styled "photo-mezzotints," and were produced by interposing a medium between the paper and the negative, so as to remove extreme sharpness, and soften harsh lines. The specimens he exhibited displayed various degrees of modified sharpness, from slight diffusion to entire want of definition. He called attention, also, to the peculiar resemblance to printing on porcelain produced in some instances.

Some conversation on the subject followed, in the course of which admiration for many of the effects was expressed.

Mr. J. T. TAYLOR exhibited some exceedingly fine slides for the magic lantern, produced by Mr. Stewart, and in the course of the conversation which followed, it was suggested that on an early occasion the slides should be exhibited to the members by means of the lantern, the Chairman undertaking to say something on the subject from an architectural point of view.

Mr. HART exhibited a convenient light tray for fixing or washing prints. It was made of wood varnished with some waterproof varnish, probably a solution of marine glue. It was fitted with a syphon arrangement. Besides being light and not easily broken, it was said to be moderate in price.

After some further desultory conversation, it was announced that there would be no meeting of the society in January, the time coming too near the period for Christmas festivities to render it convenient. In February Mr. King promised to read a paper on neglected art and scientific subjects in connection with photography.

As the CHAIRMAN declared the meeting adjourned,

**Philadelphia Photographer.*

Mr. DAWSON requested permission to ask Mr. Bedford one or two questions about the prints exhibited. Had he compared the results obtained by printing on ordinary plain paper with those obtained on the back of albuminized paper? and, if so, was there any difference?

Mr. BEDFORD said he had made such comparison, and found that he obtained a better and richer print on the back of albuminized paper.

Mr. DAWSON did not see how the presence of albumen on one side of the paper could affect the quality of the print on the other side.

Mr. SIMPSON said the presence of albumen on one side of the paper was not supposed to affect the character of the print on the other; but as all papers absorbed a certain portion of the albumen and salt with which they were coated, it was the presence of as much of those substances as were absorbed and passed through the paper, and then combined with the silver, when on the exciting bath, which gave the prints some amount of superiority over ordinary plain paper prints. It was, in short, a very simple and easy method of imitating in some degree the result produced on amorphous albuminized paper.

Mr. DAWSON thought that it would be better, if a little albumen gave an advantage to plain paper, to experiment and find out in what proportion and in what manner it would be best applied, and prepare paper on the right side, instead of using it in this somewhat indefinite manner on the wrong side.

Mr. SIMPSON said the object here was to save the trouble of experiment or especial preparation. Plain paper prints were only very occasionally required, and when, by chance, one or two were wanted, it would be very troublesome to the photographer to have to get special material and make special preparation. But he always had albuminized paper at hand, and he simply needed to float it, plain side downwards, on his ordinary silver bath to get an approximately good result, with little trouble. If the best plain paper results were required, and a demand existed for them—which, with the large rich class of pictures especially recently come into vogue, would be desirable—no doubt it would be worth while to make special preparations, and produce finer results.

A conversation followed, in the course of which commendatory reference was made to the fine plain paper prints of Mr. Hennah, familiar to photographers some years ago, and an expression of a conviction of the superior artistic effect of plain paper prints.

In the course of the conversation Mr. G. HOOPER stated that he had obtained good plain paper prints by means of a formula he was proceeding to describe, when it was suggested that he should introduce the subject by a short paper at an early meeting; and this was agreed to.

The proceedings then terminated.

LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, December 8th. Mr. J. GLAISHER, F.R.S., in the chair.

The minutes of a previous meeting were read and confirmed, and the following gentlemen elected members of the Society: Messrs. Louis Bing, Jewell, Twyman, H. Baden Pritchard, and Archibald Irvine.

THE CHAIRMAN read the seventh rule of the Society, relating to the nomination and election of officers; after which he said that during many years the Society had been honoured by the presidentship of Sir Frederick Pollock, ex-Lord Chief Baron. He regretted to say that the time had come when they could no longer have the pleasure of his able presidency. In a letter forwarded to the Council their President said that being in the eighty-sixth year of his age, and being compelled to abstain from all evening meetings, he regretted that he could no longer discharge the duties nor hold the office of president of a society which afforded him the pleasure of being associated with so many of the most enlightened practical and scientific men of the day. He also had to announce, with regret, that another officer, who had been eleven years their Secretary and thirty years a photographer, had felt, from the state of his health and pressure of other duties, he must resign his office, and Dr. Diamond would at the end of the Society's year cease to be their Secretary. The Council had appointed a gentleman (Mr. John Spiller) in his place, by whom they felt assured the duties of secretary and editor would be ably discharged. The gentlemen nominated by the Council for election were, for the Presi-

dency, himself (Mr. Glaisher), an office he had consented to hold for the following year; retiring from the Vice-Presidency, Mr. Glaisher and Mr. Durham; nominated for election, the Earl of Caithness and Dr. Diamond; retiring from the Council, Messrs. W. M. Brown, Joubert, Sedgwick, Spiller, John Williams, the Earl of Caithness, and Dr. Wright; nominated for election, Messrs. Durham, Dallmeyer, Dr. Arthur Farre, Professor Wheatstone, Dr. Mann, Wm. Mayland, and Mr. Whiting, Junr.

THE CHAIRMAN then announced that the Annual Report of the Patent Office of the United States had been presented by the U. S. Government to the Society, which they accepted with thanks. He also called attention to some coloured specimens of the "Emolliotype" process, by Mr. Notterville Briggs, and some fine carbon prints by Mr. Blair, of Perth, some without transfer at all, and some by a single transfer process, exhibited by Mr. Wharton Simpson. The specimens were examined with much interest.

Mr. H. BADEN PRITCHARD then read an interesting paper on the photographic operations in the Abyssinian War, and exhibited specimens of the photographs produced. He also stated that Sergeant Harrold, who had had charge of the photographic operations, was in the room, and would have pleasure in answering any questions on the subject.

THE Rev. J. B. READE congratulated the Society on the interest and importance of the first paper of the session. Such a paper seemed literally to transport us to the field of operations, and vividly illustrated the importance of our science in this new and important application of it. Mr. Pritchard had referred to cases in which the intensity of the light was so great that it was almost impossible to give sufficiently short exposures. This reminded him of some of his experiments in photographing the sun with the enormous telescope erected by Mr. Craig, at Wandsworth, giving an image of from 9 to 10 inches diameter. He had then to interpose a plate of yellow glass, to diminish the intensity of the light, and so obtained good negatives. Possibly a similar course might be found useful under the circumstances to which Mr. Pritchard had referred. He had pleasure in proposing a special vote of thanks to Mr. Pritchard and to Sergeant Harrold for this interesting paper.

Mr. MAYALL referred to some pupils to whom he had taught photography by the request of Lord Panmure, in order that they might practise the art during the Crimean war. He suggested that in such expeditions some dry plates—either by the simple albumen process or the collodio-albumen, both of which gave great certainty—should be taken, as well as wet plate apparatus. Such plates would often give facility for obtaining subjects when the time for preparing wet plates might not be available. The albumen process—which had not, he thought, received nearly sufficient attention in this country—would give plates which would keep twelve months. He had recently tried some prepared in 1855 which still gave an image. He would be very happy to show Sergeant Harrold his very simple process of preparing such plates. After some reminiscences of the experiences of Mr. Fenton in the Crimean war, and some remarks on the advantage of slit stops, Mr. Mayall cordially seconded the vote of thanks.

Mr. SPILLER, after some remarks on his experiences in connection with military photography, said that several suggestions occurred to him as arising out of the paper read: first, the importance, when working in a tent under a hot sun, of covering it with white; next, he thought the advantage of printing direct upon linen, as suggested by Mr. Pritchard, for purposes of this kind, must be manifest, especially after examining the excellent results which Mr. Pritchard had shown them of his own production. Referring to Sergeant Harrold, who had received a medal for bravery in the field, he thought it was satisfactory to find that he was as good a man before the enemy as behind the camera.

Mr. BEDFORD said that when he was photographing in the East he found it a valuable plan to stretch above his tent, not quite in contact, a white sheet, and when water was plentiful to wet that sheet. Such a plan was very valuable in securing coolness: indeed, during the last summer, whilst working in North Wales, he found that such a plan was very valuable in keeping cool the interior of his photographic carriage. Referring to the question of intense light, he should like to ask Sergeant Harrold how he found it in Africa. His own experience in the East was, that although the light was intense, the shadows were very dark, and exposures, except for distant

views, were not lessened by the intense light. His own average exposures were from ten to twelve seconds for 12 by 10 plates.

Sergeant HARROLD had generally found the exposures long rather than short.

Mr. V. BLANCHARD asked Sergeant Harrold what was the average temperature, as he had a vivid recollection of the difficulties in working in the almost tropical heat at Wimbledon. He had found that a wet covering to the vehicle was very valuable in securing coolness, but water was almost as scarce at Wimbledon as in Abyssinia.

Sergeant HARROLD said the temperature averaged about 100°.

Mr. SEBASTIAN DAVIS, referring to the packing of collodion, said that stoppers alone, without some extra covering, would certainly be insufficient to prevent evaporation. A box lined with felt was useful for packing such bottles.

Mr. BEDFORD said, when he went to Egypt he had each collodion bottle packed in a tin case with sawdust, which effectually prevented evaporation.

The CHAIRMAN, in putting the vote of thanks, referred to the "Norwegian Kitchen," which had such non-conducting powers that many hours elapsed before the interior was changed in temperature, and said that such an arrangement might be found valuable in packing substances like collodion. The suggestion of Mr. Bedford, of the wet white sheet, was most important, as a temperature of 30° lower than that of the atmosphere might be so secured. During last summer's experience they had the thermometer at 90°, and the dew-point at 60°. He had pleasure in putting the vote of thanks. The photographers with the expedition had conducted their photographic operations under the greatest difficulties, but with the greatest success.

The motion was carried by acclamation.

Mr. FRITCHARD, in responding on behalf of Sergeant Harrold and himself, said that the photographers were prepared with dry plates both by the coffee and collodio-albumen processes, but had no opportunity of using them. Once they attempted it in one of the Abyssinian churches, but the high priest interposed, and although Sergeant Harrold tried to hold him in parley until the plate was sufficiently exposed, he did not succeed, for the priest kicked over the camera. Regarding the light he had been slightly misunderstood. He had said that under certain circumstances short-focussed stereo lenses might be found too quick in the stroug light.

The CHAIRMAN, referring to the late exhibition, said he was informed by the attendants that no exhibition of any kind in those rooms had excited so much interest or had so many visitors, not less than about five thousand persons having seen the pictures. It was clearly a great success, and showed that there was no diminution in public interest in photography, nor any reason to fear declension in the progress of the art.

The CHAIRMAN then announced that at the meeting on the 12th of January Mr. Nelson K. Cherrill would read a paper on Combination Printing, illustrated with examples.

The proceedings then terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE adjourned meeting of the Council of the Amateur Photographic Association was held December 1st, at 12, York Place, Portman Square, Col. the Hon. DUDLEY FITZGERALD DE ROS in the chair.

The minutes of the last meeting having been read and confirmed, the two following members were elected, R. C. Walker esq. and Miss Jane Hamilton.

Mr. GLAISHER then read a report upon the present condition of the Society, and the pictures for the present year, of which the following is an abstract.

It was my agreeable duty last year to notice the steadily increasing prosperity of the Amateur Photographic Association, and it is a source of no small satisfaction to find those remarks more than ever applicable to the present state of the Society, and that the pictures contributed by the members this year greatly exceed in number those of any previous occasion. The number of pictures of sufficient excellence to be specially noticed, are as follows.

Class 1 contains 90 pictures, contributed as follows:—

Lt. Senior 13, Capt. Bankart 7, W. Bailey esq. 7, F. Beasley esq. 6, J. W. Richardson esq. 5, Major Gresley 5, Dorabjee Pudumgee esq. 4, W. D. Howard esq. 4, W. Church esq. 4,

Capt. Taylor 3, F. E. Curry esq. 3, A. Booty esq. 2, J. H. Ravenshaw esq. 2, Dr. Hemphill 2, R. Murray esq. 2, J. G. Hydo esq. 2, E. Milson esq. 2, J. S. K. Moss esq. 2, E. R. Hall esq. 1, W. H. Harton esq. 1, R. B. Bowman esq. 1, T. Brownrigg esq. 1, Dr. Wilson 1, L. Ashburner esq. 1, Rev. J. Freke 1, J. H. Ritchie esq. 1, R. Hassard esq. 1, J. Richardson esq. 1, F. S. Schwabe esq. 1, Mrs. E. Daubeny 1, J. A. Jobling esq. 1, J. C. A. Bones esq. 1, A. Suzanno esq. 1, B. Jones esq. 1.

Class 2 contains 185 pictures, contributed as follows:—

Lt. Senior 26, J. H. Ravenshaw esq. 13, J. W. Richardson esq. 12, F. Beasley esq. 10, E. Milson esq. 9, Capt. C. Taylor 7, Dr. Hemphill 6, W. D. Howard esq. 6, Capt. W. Foster 6, Major Mason 6, A. Booty esq. 5, W. Church esq. 5, J. Richardson esq. 5, Col. Holder 4, Capt. Bankart 4, J. S. K. Moss esq. 4, Capt. C. M. Layton 4, F. S. Schwabe esq. 4, J. G. Hydo esq. 3, J. H. Hutchinsou esq. 3, W. Bailey esq. 3, Mrs. Daubeny 3, R. E. Chidley esq. 3, F. E. Curry esq. 2, F. K. Barclay esq. 2, J. A. Jobling esq. 2, J. H. Ritchie esq. 2, R. Grace esq. 2, R. B. Bowman esq. 1, R. Murray esq. 1, T. Bell esq. 1, W. G. Hunter esq. 1, T. R. Lane esq. 1, D. Pudumgee esq. 1, M. Guyton esq. 1, F. H. Tanner esq. 1, J. C. A. Bones esq. 1, G. H. Wood esq. 1, R. Hassard esq. 1, T. Brass esq. 1, J. S. Holden esq. 1, J. Richardson esq. 1, F. S. Schwabe esq. 1, T. Samuels esq. 1.

Class 3 contains 282 pictures contributed as follows:—

Lt. Senior 28, Major Mason 15, L. Ashburner esq. 13, Capt. W. Foster 13, J. W. Richardson esq. 10, F. Beasley esq. 9, A. Booty esq. 8, F. K. Barclay esq. 8, J. A. Jobling esq. 8, J. Richardson esq. 8, H. Day esq. 7, K. E. Chidley esq. 7, R. Murray esq. 6, J. A. C. Bones esq. 6, J. H. Ritchie esq. 6, W. G. Hunter esq. 5, D. Pudumgee esq. 5, J. Middleton esq. 5, G. H. Wood esq. 5, J. G. Hydo esq. 5, Col. Holder 4, Capt. Bankart 4, Capt. Taylor 4, F. H. Tanner esq. 4, R. Grace esq. 4, E. Milson esq. 4, W. D. Howard esq. 4, Dr. Hemphill 3, Capt. Layton 3, L. W. Williams esq. 3, J. Guyton esq. 3, T. Brass esq. 3, J. H. Hutchinsou esq. 3, M. W. Wemyss esq. 3, Capt. Arbuckle 3, F. S. Schwabe esq. 3, W. H. Harton esq. 2, T. Bell esq. 2, H. Maxwell esq. 2, T. R. Lane esq. 2, Rev. J. Freke 2, R. Hassard esq. 2, T. Samuels esq. 2, Major Gresley 1, T. Turpin esq. 1, C. Stephens esq. 1, W. Church esq. 1, B. Jones esq. 1, R. B. Bowman esq. 1, F. E. Curry esq. 1, T. Brownrigg esq. 1, Rev. T. Hervey 1, Dr. Wilson 1, J. S. K. Moss esq. 1, W. S. T. Sinclair esq. 1, J. H. Craigie esq. 1.

Class 4 contains 209 pictures, contributed as follows:—

Lt. Senior 27, L. Ashburner esq. 18, Major Mason 13, J. Richardson esq. 12, E. Milson esq. 11, J. S. Holden esq. 8, A. Booty esq. 6, S. Samuels esq. 6, Capt. W. Foster 6, R. Murray esq. 5, T. R. Lane esq. 5, C. Stephens esq. 4, F. Beasley esq. 4, T. Bell esq. 4, Rev. T. Hervey, 4, Capt. C. Layton 4, T. W. Richardsou esq. 4, F. H. Tanner esq. 4, O. J. Jones esq. 3, A. Suzanne esq. 3, R. B. Bowman esq. 3, Dr. Wilson 3, H. Maxwell esq. 3, J. S. K. Moss esq. 3, J. Middleton esq. 3, H. Day esq. 3, R. E. Chidley esq. 3, F. S. Schwabe esq. 3, B. Jones esq. 2, J. H. Ravenshaw esq. 2, W. H. Harton esq. 2, Capt. Taylor 2, Mrs. Daubeny 2, Rev. J. Freke 2, J. A. C. Bones esq. 2, J. H. Ritchie esq. 2, M. W. Wemyss esq. 2, Capt. Grimston 2, Col. Holder 1, F. K. Barclay esq. 1, W. G. Hunter esq. 1, D. Pudumgee esq. 1, W. S. T. Sinclair esq. 1, S. W. Williams esq. 1, J. Guyton esq. 1, J. A. Jobling esq. 1, J. H. Carriage esq. 1, G. H. Wood esq. 1, R. Hassard esq. 1, T. Brass esq. 1, J. H. Hutchinsou esq. 1, W. Bailey esq. 1.

The whole of the remainder of the pictures are comprehended in Classes 5 and 6, but it is unnecessary to mention them separately.

The following prizes were awarded:—

J. W. Richardsou esq. for three pictures, Nos. 26, 30, and 50 a large silver goblet; Lieut. Senior for a pair of pictures, Nos. 263 and 272, a silver goblet; ditto for a pair of pictures, Nos. 273 and 287, a silver-mounted claret jug; Capt. Bankart for a pair of pictures, Nos. 121 and 124, a silver-mounted claret jug; W. D. Howard esq. for a pair of pictures, Nos. 125 and 126, a ditto; Dorabjee Pudumgee esq. for a pair of pictures, Nos. 12 and 14, a silver goblet; W. Baily esq. for a pair of pictures, Nos. 1 and 8, a silver goblet; A. Booty esq. for a picture, No. 94, a silver-mounted claret jug; E. R. Hall esq. for a picture, No. 7, a ditto; F. E. Curry esq. for a pair of pictures, Nos. 42 and 43, a ditto; Major Gresley for a picture, No. 31, a large album, elegantly bound in morocco, with silver name-plate; J. G. Hydo esq. for a pair of pictures, Nos. 18 and 19, a ditto.

E. Milsom esq. for a pair of pictures, Nos. 19 and 25, a ditto; J. H. Ravenshaw esq. for a picture, No. 6, an album elegantly bound in morocco; F. S. Schwabe esq. for a picture, No. 1, a ditto; Rev. J. Freke for a picture, No. 25, a ditto.

Dry Plate Prizes.

F. Beasley esq. for a pair of pictures, Nos. 87 and 100, a silver goblet; J. H. Ritchie, esq. for a picture, No. 4, a large album elegantly bound in morocco with silver name-plate; R. Murray esq. for a picture, No. 12, an album elegantly bound in morocco.

Stereoscopic Prize.

J. S. K. Moss esq. for a pair of pictures, Nos. 63 and 66, a large revolving stereoscope.

Certificates of Honourable Mention were awarded to the following gentlemen:—

W. Church esq. jun., B. Jones esq., A. Suzanno esq., Dr. Hemphill, W. H. Marton esq., R. B. Bowman esq., T. Brownrigg esq., Dr. Wilson, Capt. C. Taylor, J. A. Jobling esq., Mrs. Daubeny, J. C. A. Bones esq., R. Hassard esq., J. Richardson esq.

The Council were gratified to find that Capt. Bankart, who was prevented from exhibiting at last year, has again sent a large number of his fine 12 by 10 pictures. Capt. Taylor, though he has not succeeded in taking a prize this year, has contributed some remarkably interesting life studies taken in India, amongst which his portrait of the "Great High Priest of Brahmin," is particularly worthy of notice.

Lieut. Senior has sent from India a very large number of most interesting pictures, amongst which there are no less than thirteen of the highest class. Mr. W. D. Howard still holds his place in the very highest rank, both as regards artistic arrangement and excellence of manipulation.

Dr. Hemphill, for the first time for five years, has failed to carry off a prize, though one of his pictures, "Lady in Antique Dress," is quite equal to some of the prize pictures of former years.

Mr. E. R. Hall has sent another of his unequalled engraving copies, the original print of which cost nearly two hundred guineas.

Mr. Milsom has sent from China some 10 by 8 pictures of considerable merit, illustrating the architecture and scenery of that distant land.

Major Mason has forwarded a series of native Indian portraits, which are quite an acquisition to the Society.

Amongst our later members are several who bid fair to hold a high place in the Association, foremost of whom may be mentioned Mr. J. W. Richardson. Several of this gentleman's pictures possess that combination of "crispness" with extreme softness and delicacy of tone which, though always sought after, is so seldom attained. Mr. W. Bailey, too, has contributed some pictures of game, which, in delicacy of detail, leave nothing to be desired.

The Secretary reported to the meeting the result of an interview he had had with Mr. H. Cole, C.B., of the South Kensington Museum, relative to the "British Museum of Portraits," but in consequence of the examination of the pictures having occupied so much time, the subject was adjourned for the consideration of the next meeting.

Dr. ARTHUR FARRE proposed a vote of thanks—which was passed by acclamation—to Mr. Glaisher for his valuable report, and for the vast amount of time and attention which he had bestowed on the examination and classification of the pictures.

The proceedings then terminated.

A. J. MELHUIS, Hon. Sec.

Correspondence.

CLEANING THE HANDS.

SIR,—It is generally admitted that the use of cyanide of potassium for the above purpose had better be avoided, though I have used it for many years, until recently, without inconvenience, and have only given it up even now because many have suffered from it.

It appears Mr. Carey Lea has introduced a formula for removing silver stains from the hands, in which bichromate of potash is a prominent ingredient; I suppose, under the impression that no injury can result from its application. If I am not greatly mistaken, bichromate of potash is quite as dangerous as the cyanide, having a very deleterious action on

the system when its solution is frequently brought in contact with the skin, producing sores, which, like those caused by fluoric acid, are very painful and difficult to heal. It is true the solution is dilute, but, unless I am proved to be in error, I shall be very unwilling to "wash" my hands in so suspicious a mixture.—I remain, &c., J. H. JOHNSON.

The Vicarage, Tilshead.

[Bichromate of potash is by no means an innocuous agent, although not such a violent poison as cyanide of potassium. It has no directly injurious action on a healthy skin which is free from cut or abrasion. If it come into contact with the mucous membrane or an abraded skin, great inflammation will result, and, in some instances, serious sores follow. Any agent, however, which can be used to remove silver stains will be more or less injurious, if brought into contact with an abraded skin.]

M. Gaudin's mixture is very effective, either applied to the fingers (not cut) or linen. It is—Alcohol 1 ounce, iodine 24 grains, nitric acid and hydrochloric each 20 drops. The stain, having been treated with this preparation, is next sponged with strong hypo, which at once removes it.

We repeat the following, communicated to our pages, two or three years ago, as an excellent means of cleansing the fingers from silver stains, by Mr. M. Whiting, Jun.:—

"Put half a pound of glauber salts, quarter a pound of chloride of lime (the sanitary disinfectant), and 8 ounces of water, into a small wide-mouthed bottle, and, when required for use, pour some of the thick sediment into a saucer, and rub it well over the hands with pumice-stone or a nail brush, and it will clean the fingers quite equal to cyanide, but without any danger. This will do to use over again until exhausted, and should be kept corked up. The disagreeable smell may be entirely avoided by the liberal use of lemon juice, which not only removes the smell, but whitens the hands. Rotten ones may be used, and answer well."—Ed.]

PHOTOGRAPHERS' RELIEF FUND.

SIR,—Many as the suggestions that have been written in your Journal of late respecting the organization of a Relief Fund, I think none of the correspondents have set forth such a good, sound theory as that mentioned by yourself last week. I am strongly disposed to believe that any attempt to classify would end in failure, for the fund does not want dissension to contend with at its birth; assuredly there will be enough difficulty to surmount without touching upon that theme. Let all who think of doing any service to the cause put aside all ill-feeling, and should they have a prejudice against any certain classes, this should never enter into affairs of aid and support.

Now I am of opinion that whatever a man may be as regards social position, and he conducts himself as a respectable member of society, and connected in any way with photography (from apparatus-maker to albuminizer), he should be considered an eligible candidate, for it must not be forgotten that "unity" is strength.

Without interfering with selections, every member should be compelled to give some guarantee as to his respectability; for instance, employes could do this until the society was formed, then the new members be introduced similar to the method now in practice with photographic societies. Would it not be as well for those gentlemen who have so kindly promised support to deposit their money and form a committee for the purpose of thoroughly investigating plans for future management? My humble opinion is, that there should not be simply one fixed entrance fee and annual subscription, but several, and the benefit received to be in like proportion; by so doing those in indifferent circumstances would not be excluded from making some provision for their unfortunate days; whereas, should the subscription be great, it would deter them.

All who really and sincerely have the good of their brethren in misfortune at heart will never raise cries of inequality, for those who may now be high up the social ladder may one day find themselves at the bottom.

The above remarks are not written with the idea that they are faultless, but simply in the hope that those who criticise them may bring forward some more efficient plan.—Yours, &c., A. M. B.

[For the purposes of a benevolent fund all sums, either as subscriptions or donations, will be acceptable, and all persons properly recommended would be eligible for relief, the validity of their claims being decided by the committee in office for the

time being. We are not anxious that any deposit of funds should be commenced until arrangements are quite ripe.—ED.]

SIR,—In your last week's paper, in reference to the Photographers' Relief Fund, you call "narrowness" to professional photographers objecting to make a mixed fund. Now I, for my own part, call your doing so disinterestedness, no matter from what quarter it may come; and the average of professional photographers had to labour hard to weed out such rubbish before, or nearly so, and not to commence now to sow a second crop. You also call it industry to join photography with other business, and I call this idleness; and being actuated with a notion of making an easy livelihood is what makes us have such a number of muffs in the trade. Professional photographers are never jealous of each other, neither are they uncharitable towards relieving their distressed brethren; but they wisely and prudently disown any relationship or brotherhood with an intruding hand hedging on the borders of their province. Let me not be misunderstood. I by no means allude to respectable amateurs educated in the science—I believe some of them to be gentlemen worthy of admiration—but I allude to an idle, niggardly lot, no matter whether they be professional or amateur, who are ruinous to the trade, and who style themselves photographers, which nature never intended them for. *Longa est in jura longæ ambagis.* Let professional photographers know that photography, as a science, should not be coupled with business of a dissimilar nature, and that when respectably carried on in competent hands it affords its followers a livelihood quite adequate, if not superior, to the generality of other respectable professions. So, then, why should not any body of men be at option to exercise their own discretion, and not throw their weapons into their enemies' hands?

I am a sufferer to an extent beyond description by this objectionable spoil-trade style of business, and had to suspend my profession for some time through its means, though being a portrait and general painter before I knew what a camera was. Photography, in a measure, having paralysed painting, and afterwards having taken the disease itself, discouraged many others at the time as well as me. Still, during my suspension of the black art, I viewed its progress and studied it all through with unwearied interest, and have continued doing so to the present moment; and if those persons who are working in the idle system were to work for improvement by laying a good foundation to base their success on (by at first undergoing a due course of training, and afterwards their own practice, if well studied, is about the best means of improvement, together with the many valuable hints from time to time in the journals from several able photographers, both professional and amateur, which they can have for a mere trifle), they would very soon, if possessed of anything in the shape of artistic genius, turn their labour into gold; while in their present state their work is a disgrace to them, and they may not take more than six tolerably good photographs in a year, and these by mere chance. Consequently, their work is not deserving of an ordinary price, perhaps 5s. or 6s. per dozen and less; whereas, if competent to do better work, they could charge from two to three times the price, and please their customers far better.

So, Mr. Editor, lest you may think I am intruding too far on your valuable space, I shall conclude by requesting of you not to crop my letter this time as you did the last, and I shall not appear again. Though I may be a passable hand at my work, I know that I am a bad statesman, and will leave the subject in future to the more learned.—I am, sir, your obedient servant,
Clonmel, December 7th, 1868. PATRICK O'CONNOR.

[We excised from our correspondent's last letter some passages which were somewhat strongly worded in reference to what he regards as the "spoil-trade" hangers-on. We shall not be suspected of sympathy with any who degrade the profession by bad work or low prices; but in a benevolent undertaking we deprecate a narrow spirit and any attempt to draw a line which might unintentionally exclude some worthy persons from interest in such a fund.—ED.]

Talk in the Studio.

CARRIER'S SENSITIVE ALBUMINIZED PAPER.—We have recently received from Mr. Solomon an example of Carrier's permanent sensitive albuminized paper, for which he is the

English agent. Our readers will remember that we gave a tolerably full report of the result of some trials we made some months ago with paper which had then been prepared several months. We have, within the last few days, again tried the sample which we received some time ago, and which has been prepared nearly twelve months. We found it perfectly unchanged in all respects, without a trace of discolouration; and printed and treated throughout side by side with that just received from Mr. Solomon, there was no difference in result, both being perfectly clean and pure. The unchangeable character of this sensitive paper is thus proved beyond a question. Its qualities remain just the same as we before described them. It gives an exquisitely delicate and soft print, but lacks a little vigour, unless a negative with full contrast be employed. A special toning bath is recommended, which we before tried with success; this time we used an old sulphocyanide of gold bath, made some months ago, with perfectly good results.

THE EX-PRESIDENT OF THE "CONFEDERATE STATES."—We have received from Mr. Netterville Briggs some portraits of Mr. Jefferson Davis, who is now resident in Leamington, where, amid the magnificent Midland scenery, and the grand historic associations of the district, he rests in comfort after the years of terrible struggle which he so bravely—whether wisely or well it is not necessary to say—conducted in behalf of Southern independence. The portraits are admirable photographs of a grand face: a purely nervous temperament, a broad, massive, thoughtful brow, keen, well-cut features, a powerful but not coarse jaw, a firm mouth, and thoughtful eyes, all contribute to present a man of mark. These portraits, without robbing the face of the traces of what it has passed through in thought and feeling, give it much more refinement than we have seen in any of the American portraits of Mr. Davis. We have here the intellectual, cultivated gentleman, as well as the man of daring enterprise and indomitable will. Mr. Briggs has secured really fine and artistic portraits, photographs worthy of his worthy subject.

MEMBERS OF BRITISH ASSOCIATION.—Mr. Sawyer, of Norwich, has favoured us with a selection of the card portraits of the distinguished members of the British Association who sat to him during the recent meetings in Norwich. The photography is good, and the portraits are excellent.

PERSONAL LUGGAGE.—A correspondent calls our attention to a decision, on the subject of "personal luggage," directly opposite to that we recently recorded in the case of Mr. Owen Angel. An action was brought before Mr. Spooner, Judge of the North Staffordshire County Court, by Mr. Collis, a commercial traveller, against the North Staffordshire Railway Company, for the removal of his luggage at a wrong station, causing him delay and loss, precisely as Mr. Angel suffered loss. Instead, however, of taking the luggage to Derby, the guard put it out at Uttoxeter, and conveyed it to Stoke-upon-Trent, Mr. Collis thus being deprived of the use for two days. He accordingly sued the company for damages for the inconvenience thereby occasioned. The defence was, that the luggage ought to have been labelled or addressed by the plaintiff, and that as the claim for damage was mainly based upon the temporary loss of price lists and account books, which were in one of the packages, and which were not in the nature of "personal luggage," the company were not liable. The judge held that it was the duty of a railway company, either by a uniform system of labelling, or by some other effectual way, to guard against the possibility of such mistakes. The articles in question were not such as to divest the portmanteau of its general character as "personal luggage," and he decided in favour of the plaintiff.

PHOTOGRAPHIC NUISANCES.—The *Tomahawk* says:—"We do not intend to follow the example of some of our elegant contemporaries, and puff the reigning Lais or Phryne of the day. But we wish to enter a strong protest against a custom, which has now extended to shops in the most fashionable localities, and which are much patronized by the mothers and daughters of society; namely, the custom of exhibiting, in the most conspicuous part of the windows, portraits of the most notorious courtesans of the day, amongst the Royal Family, the Bishops, and Prime Ministers, and other celebrated personages. We can readily believe that the young ladies of moral England may have some curiosity to see authentic portraits of those whose manners, but not whose morals, they so perseveringly copy; but such a morbid curiosity it is to us a sign of the gross degradation of society. It sickens us to see the course, idiotic,

sensual features of these goddesses promoted from the scullery to reign over the Casino, impudently smirking and leering side by side with the pure gentle faces of those whom all Englishmen justly love and honour. Is it come to this, that we wish publicly to confess our shame? to declare to all the world that we have so degraded fame to the level of notoriety that a great philosopher, a venerable bishop, or a well-beloved princess, is but on a par with the last 'lady of the ballet,' who has perpetrated the most popular feat of clumsy indecency at one of our theatres, or the favourite pet of the hour, whose pockets are filled with the money and the love letters of our gay youth? Shame on all respectable tradesmen who thus turn their shops into an advertising mart for unblushing profligacy!"

To Correspondents.

E. D. S.—The film dissolving when the varnish you describe is applied arises from two causes: it is probable that the methylated spirit you have used is somewhat strong, or possibly contains an unusual proportion of wood spirit, in which case it would act as a solvent of a collodion film; it is also probable that the collodion is of that character which is easily dissolved by means of strong alcohol or methylated spirit. The mastic varnish, or gum mastic and turpentine, would not produce such a result. There are two remedies: one consists in coating the negative before it is dried, after fixing and washing, with a weak solution of gum; this will protect the film from the solvent action of the varnish; the other is to add a few drops of water to the varnish: this will cause it to be turbid at first, but it will clear with standing. Try, on a small quantity, to ascertain the amount of water necessary.

EON.—If you had sent us an example of your failures we could better have advised you. The bad yellow colour of which you complain in the whites of your eburneum prints may arise from the gelatine not being of good or suitable quality, or from using insufficient of the oxide of zinc, or from using that article impure. Pure oxide of zinc should be used, not that at 3d. per pound; for if the latter be pure, it would not be sufficiently fine, and the proportions stated in the formula would not be sufficient to give the gelatine a good colour. If it contain any impurity, that may also account for the blacks turning a bad colour. 2. Zinc white is sometimes called Chinese white. 3. Gum kowrie is a fine white Australian gum, analogous in appearance to fine sample of copal. At one time high hopes were entertained of its probable value for varnish purposes, but its imperfect solubility has rendered it comparatively useless.

J. C. (Morice Town).—The lens of which you speak ought to have given you better definition than you describe, especially if used with a suitable stop. Either of those you name will, we believe, be good; but we should prefer A.

A SUBSCRIBER.—Write to Mr. Blanchard, 12, Camden Cottages, Camden Road. It is very probable that he will give you satisfactory particulars.

AN OLD FOLKESTONE SUBSCRIBER.—The photographs of many of the continental galleries are taken direct from the paintings; but in the Dresden series to which you refer, the negatives are taken from monochrome copies drawn for the purpose. 2. We believe that they are not protected by copyright law. 3. An old and ripe collodion which has lost a little sensitiveness is often useful to add to a newly-mixed sample, and, to some extent, anticipates the effect of time upon the new. 4. Collodion kept mixed with nitrate of silver is apt to undergo decomposition, and become brown, as you describe. In our experience, collodio-chloride of silver keeps better mixed than the collodion with nitrate of silver does. Nevertheless, it is not quite certain that it is useless. Mix the two solutions in their due proportions, and, after a day or two, try the collodio-chloride of silver formed. We have at times found that the addition of the chloride restored the colour, or nearly so, and that the product might be used without serious disadvantage. In any case, the solution containing the chloride is good, and might, by the addition of a few drops of an aqueous saturated solution of nitrate of silver, be converted into collodio-chloride of silver.

G. AVERY.—If your pictures were sent in a packing-case, they would be packed and sent back to you; but if they were left at the gallery by hand, we presume they will remain until called for. An answer to your enquiry was written a fortnight ago; but, by an oversight of the printer, was omitted to be inserted.

A BEGINNER.—An analysis of the kind you state would require more time than we could devote to it at present, and would be of very little service to you when done. State your object in requiring such information.

W. J. A. G.—We do not wish for—nor, indeed, could we take charge

of—subscriptions now. We simply desire to know what amounts photographers are willing to contribute, so as to form some estimate of the propriety of forming a committee to administer the promised amounts. The dry-plate view is very excellent indeed. The comical portrait of the little dog is very good. Thanks. We hope the YEAR-BOOK will meet your anticipations.

A LEARNER.—Almost all the chemicals used by photographers are poisons; but those in which he is chiefly concerned, to which the restrictions of the new Act refer, are cyanide of potassium and bichloride of mercury. The distilled water obtained as you describe will be pure if the vessels are clean.

W. G.—The Liverpool dry plates are prepared by a collodio-bromide process, but the precise details of their operations are not published. Sugar-candy will not answer the same end as grape sugar. You can get the right article of photographic chemicals. You will find details surely in any work on organic chemistry. What work of the kind have you consulted which contains no allusion to grape sugar? Look for it in the index under "glucose" or "nitro-glucose;" if you do not find it, under grape or sugar; but it will certainly be treated under the head "sugar." 2. We prefer carbonate of ammonia to liquid ammonia in alkaline development. 3. No: the mixture does not keep.

CANADA.—The piece of print you enclose bears no trace of imperfect fixation, but seems rather impoverished by excessive action of the hypo bath. A fixing bath with one ounce of hypo in one ounce of water is too strong. We prefer a strength of 4 ounces of hypo in a pint of water for general purposes, and an immersion of fifteen or twenty minutes. Taking the print out of the fixing bath for a minute or two to examine it, and then returning it, would not be injurious.

EDUCATOR.—Add a little of a 10-grain solution of common salt to your discoloured silver bath, and shake well. The precipitate will generally take down with it the colouring matter.

J. C. B.—When you use the back of albuminized paper for producing plain paper prints, select a thin paper, through which, to some extent, the albumen may have permeated; for remember that the albumen is the element of vigour and warmth of tone. You have used a thick paper, and have not printed deep enough. A weaker toning bath is also generally required. Your examples are over-toned.

AN AMATEUR (Cheltenham).—Make a 10-grain solution of carbonate of soda, and add a few drops to the bath, just sufficient to make it turbid after shaking it well; then place the solution in a clear bottle for a few days, and expose to the best sunlight which the season affords; then filter, and try the bath. It may possibly require a drop or two of nitric acid, but will then probably work all right.

OXONIENSIS.—There is little doubt that both letters were taken out of that "imaginary letter-box" to which you refer, and that self-consciousness of unverity led to the insinuation of bad faith in others. The person to whose criticism you refer appears under many aliases, and supplies most of the contributions to the said "imaginary letter-box." The matter is not worth serious notice from any one. *Quos Deus vult perdere dementat prius.*

J. W. SMITH.—We shall have pleasure in proposing you as a member at the next meeting. You can send post office order for 10s. 6d., the amount of subscription, to the treasurer. You will be entitled to the presentation prints of this year.

H. S.—Your card lens will be the most suitable to employ with a magic lantern; better than any of the others, or any combination of them. As to the gas-bags, the manufacturer of whom you will buy them can give you the most efficient advice.

VENATOR.—The prints arrived too late for acknowledgment in our last. They are both very excellent.

J. MARTIN.—Received. Thanks. In our next. We see the blunders you point out in other pages; but we do not care for the task of pointing them out or correcting them. The range of influence is too limited to be seriously mischievous.

CYANIDE.—We have several times called attention to the fact that after this year photographers will not be able to procure cyanide of potassium of their regular dealers; it can only be then obtained of a qualified pharmaceutical chemist.

W. SAWYER.—Received. Thanks.

G. B. SHEPHERD.—Thanks.

J. CARBUTT (Chicago).—The *Art Journal* duly received. Thanks.

PHOTOGRAPHERS' RELIEF FUND.—A copy of the rules of the "Artists' Amicable Fund," and two letters containing suggestions for a Provident Fund, duly received, and shall shortly have attention.

D. WINSTANLEY.—Received. We will answer shortly. Several Correspondents in our next.

All Communications for the Editor to be addressed to 15 Gough Square, Fleet Street, London, E.C.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

	PAGE		PAGE
Decline in Photographic Book Illustration.....	601	On Intensifying Negatives. By George H. Fennemore.....	606
"Watching the Lark".....	601	Means of Equalizing Exposure with Wide-angle Lenses. By	
Photography in the Theatre	602	John M. Blake.....	607
New Style of Mount for Photographs	602	The Cause of Pinholes in Dry Plates. By Sebastian Davis.....	608
Washing Sensitive Plates.....	602	Proceedings of Societies—Edinburgh Photographic Society—	
An American Examination of Mr. McLachlan's Discovery	603	South London Photographic Society—French Photographic	
Pictures by the Action of Cold. By D. Winstanley.....	603	Society	608
Photography in Connection with the Abyssinian Expedition.		Correspondence—Lux Graphicus on the Wing	610
By H. Baden Pritchard.....	604	Talk in the Studio	611
A Visit to the Photographic Studio of the Imperial Military		To Correspondents.....	611
Geographical Institute in Vienna. By Alois Nigg	605		

DECLINE IN PHOTOGRAPHIC BOOK ILLUSTRATION.

THE extended application of photography to the purposes of book illustration which has prevailed during the last few years has been a feature of considerable interest and importance in connection with the progress of the art. For some years past there was a steady growth in this branch of the art. Photographs from nature, photographs from drawings made for the purpose, photographs from paintings and engravings, have variously been employed in taking the place of engravings in illustrating new works or choice editions of standard works. This form of illustration has of late years been especially chosen for Christmas books, and, at this season of the year, it has always been a matter of interest to us to examine the advertising pages of literary journals for announcements relating to photographic illustration.

We have more than once, however, felt it necessary to put on record a protest against the quality of much of the photography we have met with in this branch of the art. It has frequently been far below or far behind the standard of the day: sometimes poor and unartistic in result, often so careless in execution as to give no promise whatever of permanence. The explanation has been a very simple one: it has been done by contract, at a low price, and often under great pressure for time. We have feared, however, that such facts, which were the only things coming under the attention of the public—the explanation being neither known nor cared for—must eventually seriously damage the art, and we now fear that a decline rather than an extension in this branch of the art is taking place. We have been struck with the singular paucity at this period, when they should be plentiful, of the advertisements of books illustrated with photographs. But this alone might not necessarily indicate a falling off in the actual issue. A singular but significant fact, however, was recently brought under our attention. In conversation, a few days ago, with the reviewer-in-chief of one of the principal daily papers, he informed us that of nearly one hundred and fifty volumes of Christmas books now on his table for review, there was not one illustrated with photographs, a circumstance unprecedented in his experience for many years past.

We wish to draw no sweeping or general conclusions from insufficient premises; but such circumstances as those to which we have just referred are sufficiently significant to suggest some grave thoughts on the subject, and especially to give emphasis to the importance of adopting permanent printing processes, and of conducting silver printing processes with all attention to the best known conditions of permanency.

"WATCHING THE LARK."

WE have refrained from noticing the charming picture presented to the members of the London Photographic Society by Messrs. Robinson and Cherrill until copies were ready for distribution. A specimen print was exhibited at the Society's meeting in May, and received general admiration; and another formed a great source of attraction at the recent exhibition in Conduit Street.

The subject and treatment combine to render this picture one of the most charming, and, we think, one of the most popular subject-photographs ever issued. The scene is a landscape in Borrowdale: seated on a knoll in the foreground, surrounded by wealth of wild flowers, weeds, and ferns, is a pretty little child. She has been gathering the wild flowers, and her little basket, filled with them, has just dropped from her hand, which still lingers resting upon the handle. But the basket and flowers are no longer absorbing her attention; the upturned face is filled with wonder and delight as she watches the circling flight of the lark, and listens to its song. Every feature of the face, every muscle of the body, expresses rapt attention and childish ecstacy. The scene, we said, is in Borrowdale, and Wordsworth's lines, written on the spot, accompany the picture,—

"Up with me! Up with me, into the clouds!
For thy song, lark, is strong;
Up with me! Up with me, into the clouds!
Singing, singing,
With all the heavens about thee ringing."

Beyond the knoll on which the child is seated, forming the foreground, stretches a fine landscape with woodland, and stream, and bridge in the middle distance, and the grand hills of the English lake district in the distance, surmounted by a fine sky. The picture is so full of life and thought, and so perfectly harmonious, and has so much the feeling of spontaneity and naturalness, that it is not until the student examines it to gain a lesson that he will think of the composition, or even imagine that it has been composed at all; and then he will be struck with the admirable pictorial and technical skill involved in its production. Pictorially, the composition of the lines is excellent, the figure and immediate accessories forming an irregular pyramid. The head thrown back to watch the soaring chorister, and the position of the body which naturally follows, would give the figure an uncomfortable, imperfectly balanced effect; but the little arm, resting on the basket, forms a line which supports the body, and the basket and the little hat, which is carelessly thrown down, complete the pictorial balance. As in a hilly county it should do, the horizon line is high, being not less than a third of the depth of the whole from the top of the picture. The result is, that the tender but atmospheric nicely graduated greys of the distance and middle distance form the practical

background to the figure, and are most effective in giving it relief. A perfect sensation of light and air pervades the whole picture, and the lighting of the figure is in admirable keeping. The exquisite variety, gradation, and balance of tones complete an admirable pictorial result. The technical management of the printing from two negatives is a marvel of success.

Whilst we recommend the careful examination and analysis of the composition of this picture as affording an excellent lesson to the student, we especially direct his attention to the charming expression of thought involved. Balance of lines and tones, gradation, harmony, and other pictorial qualities are necessary elements in a picture; but these should be subsidiary to thought and its perfect expression. Whilst a group of persons were eagerly examining the copy hung in the recent exhibition, one remarked: "What a pity that the lark itself could not be introduced into the picture!"

"But it is there," rejoined another discriminating observer.

"Where?" was the response: "I don't see it."

"Probably not; but the child does, and I can see the expression in her face which proves it."

The criticism embodied here was excellent and true, and of a character we commend to the thoughtful art student.

Other presentation prints to the members of the society, from Mr. Claudet, Mr. England, and Mr. Mayall, will follow in due course, and will each, doubtless, illustrate different phases of excellence and photographic interest. We are glad to notice that the distribution of presentation prints seems to have become a feature in societies as universal as it is pleasant; and it is worth note that Mr. Robinson—or, more correctly, Robinson and Cherrill—have supplied presentation prints of different kinds to no less than four societies this year.

PHOTOGRAPHY IN THE THEATRE.

AMONGST the curiously-varied applications of photography, its aid to the scene-painter is not one of the least interesting. At the annual dinner of the South London on Saturday evening last, Mr. Jabez Hughes recalled an incident illustrating strikingly the value of photography in decorative art, a form of art in which, more than in any other, conventional modes of treatment take precedence of the literal truth of nature. Upwards of twenty years ago, Mr. Hughes being at the time engaged with Mr. Mayall, Mr. Telbin, the well-known scene-painter, called at the studio in the Strand, and wished to have a series of Daguerreotypes taken of a quantity of white satin, fresh from the draper's shop, the widths sewn together, and suffered to fall into its own natural folds, without arrangement or design on the part of the artist. To secure a record of the design in anything like useful proportions it was, of course, necessary to take a portion at a time of the satin, the complete effect being comprised in a series of five by four plates. The purpose of Mr. Telbin was to paint a drop-scene for Drury Lane Theatre, and his aim was to produce the most perfect literal transcript of a beautiful curtain of white satin, with all its little sharp accident folds and creases, as well as its general masses. Every one who has visited Drury Lane Theatre is familiar with the scene, and knows how complete is the illusion. So perfect and satisfactory is the result, that whatever other changes have been made in the decoration and scenery of the house, this remains through every management in constant use, and continues until now a perfect and most illusive presentment of a white satin curtain.

At the Haymarket, Mr. O'Connor, the accomplished scenic artist of that theatre, has used photography in another form. When scenes of an architectural character are required, representing actual places, he has found useful a transparent photograph of the subject, the image

of which is projected by means of a magic lantern on the canvas, and this image serves as a perfect guide in securing accurate proportion and perspective correctness. In both these applications photography does yeoman's service to the painter.

NEW STYLE OF MOUNT FOR PHOTOGRAPHS.

Mr. Fox has recently brought under our attention a new style of tinted mount for photographs which, under some circumstances, is very effective. For a long time the mount with an Indian paper tint, or a delicate grey, in immediate contact with the picture, has been a favourite with photographers. It had the especial advantage of giving value to the whites of the photograph, which, especially in the days of the old toning and fixing baths, if in contact with a pure white mount, often appeared a little degraded. Perhaps for a fine portrait print, printed fully out, nothing is more effective than the kind of mount we have just described. But there are circumstances in which such a mount ceases to be suitable or effective, and to meet these cases Mr. Fox's new style of mount is designed.

The new mount, instead of having a tint for immediate contact with the picture, surrounded by a broad white margin, is printed with a broad tint, which constitutes the margin, with a space of plain white in the centre, leaving a margin of white to come into contact with the picture itself. This effect with many pictures is very pleasing. For instance, in landscapes where the sky has printed through to a delicate tint, the print, if mounted on an India tint, would appear to have a white sky; mounted, however, in contact with the white portion of a board having a tint beyond, the atmospheric tint of the sky receives its full value, and the picture becomes effective. The same is true of vignetted portraits in which the background softens into a grey tint instead of into white, and in a number of other cases the new style will produce a more pleasing result than any yet devised.

The new style exists in various tints, and having centres of various shapes and sizes to suit all pictures.

WASHING SENSITIVE PLATES.

AT the last meeting of the South London Society an interesting discussion arose as to the causes of pinholes in dry plates. The subject was not, we think, by any means exhausted, and we do not intend to renew it here; but we wish to call especial attention to one important observation made by Mr. Sebastian Davis, who opened the question.

Dry-plate photographers have often been warned of the dangers of washing a plate fresh from the nitrate bath with any kind of "common water," as the chlorides, carbonates, &c., in such water would precipitate on the plate insoluble silver salts, which, becoming firmly attached to the spongy surface of the film, would result in spots, stains, &c. It has become, therefore, a tolerably generally recognized canon of dry-plate photography, that the first washing of the plate after it leaves the nitrate bath should be effected with distilled water. But Mr. Davis pointed out another danger, obvious enough when once indicated, but which has, singularly enough, been generally overlooked. He showed that the use of distilled water was not a certain means of avoiding a precipitate of an insoluble silver salt. The nitrate bath, containing a certain amount of iodide of silver in solution, would precipitate a portion of this if diluted, and as the first application of distilled water in washing is a practical dilution of the free nitrate on the plate, a precipitate of iodide of silver was thrown down, and, unless especial care were used, this would become attached to the film and prove a source of pinholes. He suggested, therefore, that the plate should be kept in motion, and the water so applied as to check the risk of a precipitate settling on the film. To aid this we suggest

the importance of using a dipping bath of distilled water for such washing, and the frequent moving of the plate whilst in the bath. By a little care, and a knowledge of the danger, it is obvious that the precipitate in question may be prevented from exercising any detrimental influence on the plates.

AN AMERICAN EXAMINATION OF MR. McLACHLAN'S DISCOVERY.

A COMMITTEE having been appointed by the Photographic Section of the American Institute to examine the propositions put forward by Mr. McLachlan, Mr. Newton, an able New York photographer, recently reported on the subject. He said that the committee had not entered into any concerted examination of the subject, but had experimented independently, and compared notes. We extract from *Humphrey's Journal* some of the remarks of the experimentalists:—

Mr. Newton stated that he did not follow Mr. McLachlan's directions, either in the mode of making the bath alkaline, or in the proportions of silver and water. Mr. McLachlan exposes one ounce of silver dissolved in one ounce of water to the sunlight for three months. Now as the solution, to make it suitable for the negative plate, must have added to it ten or eleven ounces of water which has not been subjected to the influence of the sun's rays, it appeared to him that a much longer time would be required to prepare a bath by Mr. McLachlan's process than by mixing the silver and water of the proper strength at the commencement.

It would appear evident that the action of light is on the solution, and not on the silver, for if it were on the latter you would get the same effect by exposing your nitrate of silver crystals to the action of sunlight.

To prove the correctness of this theory I added to a 40-grain bath, containing 54 ounces of solution, 1 ounce of crystals of nitrate of silver. The working properties of the bath were not perceptibly changed by the addition. This bath had previously been worked down from 45 to 40 grains to the ounce.

Mr. Newton, therefore, made his bath of the strength he wished to use it, then added to it one half grain to the ounce of cyanuret of potassium, and one drop to the ounce of concentrated ammonia, and exposed several baths for different periods of time.

He found that a bath thus prepared and exposed two weeks required the addition of a few drops of nitric acid, leaving it, however, decidedly alkaline, when it would make beautiful negatives, leaving nothing to be desired.

A bath prepared in the same way, and sunned six weeks, worked perfectly clear and brilliant, without the addition of any acid; from which fact he concluded that the longer such a bath was sunned the more alkaline it can be used,* and the more intense would be the negatives.

Mr. Newton, fearing that there would be some considerable scepticism manifested by members of the Society, came prepared to silence all such scepticism. He brought with him eight or ten negatives, and also a small bottle of the negative bath in which they were sensitized, and some red litmus paper which he introduced into the bottle containing the bath, when it instantly turned a deep blue colour. The negatives which he exhibited as made in-doors were portraits, and made by Mr. S. A. Thomas, one of the committee; those made out-doors were made by Mr. Newton. They were all very brilliant and of a beautiful intensity.

Mr. Newton stated that nothing had been done to any of them further than developing, fixing, and varnishing; no redeveloping or strengthening of any kind had been necessary.

Mr. Thomas prepared his bath in the same way as did Mr. Newton, except in making it alkaline; he followed Mr. McLachlan's directions by using caustic of potash.

Mr. Thomas stated that he had used the bath in which the negatives on exhibition were sensitized very much longer than he had ever been able to use an acid bath, and, up to the present time, it had shown no signs of disorder.

Mr. Newton stated that the results were so contrary from what he had expected, and differed so widely from the universal experience and theories of photographers, that he hardly expects photographers to be fully convinced except by actual experiment. He believed it to be a subject of more importance to professional photographers than any which had been presented to them for a long time; and when all of the committee have completed their experiments, and are prepared to present a full report, the subject will be so definite and fixed that there can be no possible mistake made by any one wishing to adopt the use of the alkaline bath.

PICTURES BY THE ACTION OF COLD.

BY D. WINSTANLEY.

THE terms heat, light, and electricity, are terms used to indicate three of the great divisions under which a vast variety of phenomena are classified by writers on natural philosophy. In the pages of scientific encyclopædias photography finds its place under the heading of "light," the force upon which the science of optics is entirely based. This science, as its name implies, explains the various phenomena which appear for recognition to the organ of sight. Since, however, the emissions which produce the photographic effect are not necessarily such as may be seen, it is scarcely correct to say photographs are produced by the action of light, and, indeed, the word "photograph" itself is not altogether a proper term. The force of actinism, as we now call the chemical power of light, is scarcely yet sufficiently well understood to warrant the substitution of the term "actinography" in place of the firmly grounded and almost irremovable word "photography," which latter term forcibly calls up in the mind of every one the idea of pictures produced by the action of light. The production of pictures by the influence of electricity—electrotypes, and the telegraphically transmitted autographs of Mr. Bakewell, for instance—are also familiar to readers of works on natural science; but the production of pictures through the influence of heat—or, as the writer has more incorrectly worded it above, the action of cold—as a possibility by no means so generally known.

Between the months of November, 1863, and March, 1864, it was the writer's fortune to winter in Wisconsin, U. S. The weather was exceedingly severe, the thermometer falling frequently to as much as 38° degrees below zero (Fahrenheit.) Cold like this, especially when accompanied by a strong wind, tries human powers of endurance to a much greater extent than they ever are, or perhaps, than they ever have been, in England. During the winter alluded to, Lake Michigan was frozen as far as the eye could reach, and when the ice broke up in the harbour of Milwaukee it was twenty-six inches in thickness. The snow in the districts round about the town was fourteen feet in depth; and on New Year's day, 1864, eleven persons were frozen to death within the city limits. At the commencement of these "cold spells," as those period of intense cold are termed, the thermometer frequently falls more than fifty degrees in a single night. Under these circumstances, all the moisture floating about in the atmosphere of a room is congealed to the form of a thick coating of ice upon the windows, which ice is crystallized in a more or less opalescent form, according to the rapidity of the condensation. One morning, upon entering the drawing-room of the house where he resided, the writer's attention was arrested by the beautiful and regular design given, in different degrees of opacity, by the ice upon the windows. These windows descended quite to the floor of the room, opening on to a verandah on the outside. The design alluded to upon the frosted glass was vague and indistinct at an elevation of fifteen inches above the floor, but became more sharp as it descended, until quite at the bottom the leaves and flowers of the carpet were distinctly and unmistakably traced upon the glass. The writer called the attention of several others to this interesting phenomenon, which all were able to see without difficulty was, as the writer has stated, a representation of the design upon the carpet. The different degrees of facility with which radiation was possible from the various colours forming the design on the carpet affords no doubt of the true explanation to be given for the production of the design upon the window.

The writer has attempted to repeat the production of pictures by the action of cold upon the table of his laboratory, but, so far, without success. It may, however, be worth while to mention the method adopted in this attempt. An aqueous solution of iodine and iodide of potassium, strong enough to emit a powerful odour of the elementary body

* Mr. Newton overlooks the fact that the continued action of light on a silver solution would reduce silver, and liberate nitric acid.—Ed. F. N.

(thereby proving its existence in a state of vapour), was made. This mixture was then poured into a shallow porcelain vessel, and covered with a plate of glass upon the under side of which was a film of uniodized collodion, and on the upper side of which was placed a piece of white paper having large black letters printed upon it. Over this paper a clear plate of glass was placed, upon the upper surface of which ether was continually dropped for several minutes. The idea of the writer was that the cold produced by the evaporation of the ether would absorb the heat from the sheet of paper beneath, and consequently from the collodionized glass under it, with different degrees of facility, varying with the radiating power of the black letters and their white ground. The collodionized plate was then removed from beneath and plunged into a silver bath, the writer hoping that the amount of iodine condensed upon the collodion surface would vary with the radiating power of the letters and their ground. The plate, after removal from the silver bath, was exposed for a few seconds to the action of daylight, after which a common iron developer was poured over its surface. The whole developed up almost black, but the writer was enabled to distinguish upon its surface any semblance to the letters whose image he expected to obtain. Some of the readers of these pages may perhaps see the error committed in this experiment, and, if so, indicate a means by which it may be avoided, thereby enabling us to repeat the experiment of producing pictures by the action of cold.

PHOTOGRAPHY IN CONNECTION WITH THE ABYSSINIAN EXPEDITION.

BY H. BADEN PRITCHARD,

OF THE GENERAL PHOTOGRAPHIC ESTABLISHMENT OF THE WAR DEPARTMENT.*

THE purposes for which photography was used with the army in Abyssinia were very different to those for which it is generally employed by professional followers of the art. Photography in that campaign fulfilled all the duties of a printing-press in the field, and rendered unnecessary, in many ways, the employment of skilled draughtsmen and lithographers. Maps, plans, and sketches of routes were by its means elaborated and put together, and afterwards multiplied with unerring exactitude and great rapidity. This was the principal function performed by the art, and for the fulfilment of which the photographic equipment was sent out; the taking of pictorial views and sketches of the country, although forming an important part of the photographer's duties, was a matter of secondary importance, and partook more of a semi-official character.

In moving an army over an enemy's land, especially if that land be an untravelled and unknown one like Abyssinia, it is imperatively necessary for the commander-in-chief to obtain correct information of the nature of the surrounding country, the state of the roads, &c., over which his troops will have to pass. For this purpose *reconnaissances* are frequently pushed forward to the front and on the flanks of the army, to examine and survey the adjacent ground; and staff officers, who have previously received special instruction in their duties, carefully sketch out a plan of the district visited, which they forward, together with such information as may have been collected, to the Quartermaster-General's Department. A scale is of course attached to every plan sent in, but this need not be the same in all maps; for when the latter, after examination and verification, are forwarded to the photographers to be copied, an enlargement or reduction of them is easily made to one uniform scale. The copies are printed upon salted paper, and mounted upon linen; and the work is done so rapidly that it frequently happened that thirty prints were produced and distributed within twenty-four

hours of the receipt of the original plan. In order that officers might be acquainted with the method of working adopted by the photographic staff, and likewise with its resources, General Simmons, C.B., R.E., prior to the despatch of the equipment, carefully drew up a memorandum relating to it, for the information of all concerned. According to this document it was stated that whenever a plan was forwarded to be reproduced, the first copy might be expected in about two hours, after which copies would succeed each other at the rate of about four per hour of sunlight. To so great an extent was photography used in this connection during the late American war, that within the period of one month, during General Grant's advance to the Rapidan, no less than 1,200 maps of this kind were circulated. Thus it will be seen that at the present day photography plays a most important role in aiding the movements of troops, often furnishing the several commanding officers of the different branches of the army with details of a *reconnaissance* taken only the day before.

Seeing the importance of the services to be rendered and amount of work to be performed, it was necessary to furnish a very ample photographic equipment; and the collection of instruments and materials sent out was therefore a bulky affair. The selection and arrangement of the stores and apparatus was entrusted to Captain Stotherd, R.E., and Lieut. Anderson, R.E., the Instructor and Assistant Instructor in Photography at the Royal Engineer Establishment at Chatham, gentlemen, therefore, possessing considerable experience in the art, and well acquainted with the necessities likely to be required for a campaign; and the general success which attended the working of the equipment was in great part attributable to the excellent manner in which these officers acquitted themselves of their onerous duties. Two separate outfits were supplied, each contained in eighteen boxes; but only one of these was used and taken forward with the army to Magdala; the reserve outfit remained at Senafe, and was returned to England intact. The equipment may at first sight appear far too extensive; but when it is remembered that the nature of the work to be performed involved the employment of a large camera, the supply of other necessities was of course also requisite of corresponding size and quantity; it must likewise be borne in mind that the duties of the photographers were not confined to taking negatives only, but that the greater part of their labours were devoted to the processes of sensitizing, printing, and mounting, operations which had mostly to be conducted within the limits of the dark tent with which they were provided. A large copying table, mounting boards and material, washing utensils, a portable still, &c., were found to be almost indispensable, and helped to swell the list of incumbrances to a notable extent, not to mention the glass plates for the negatives and paper for the positives, of which sufficient was provided in each equipment for taking 200 large *cliches* and 1,700 prints.

On any future expedition of this kind the application of photography will no doubt receive even more extended employment than at present. It would afford the most invaluable information to commanding officers if the mechanical *reconnaissance* sketches were always accompanied by an actual photograph showing the nature of the ground surveyed. If a small stereoscopic view were thus attached to the map drawn to scale, one would immediately be able to understand the true character of the district; all the mountains, ravines, rising ground, declivities, rivers, lakes, &c., would be shown at a glance, and their position at once comprehended. The negatives might easily be taken by the staff officer making the *reconnaissance*, who would be provided with a small camera and a couple of dark slides containing dry sensitive plates. He would require at the most but five minutes to perform the duty, and would simply need instruction as to the approximate time necessary for the exposure of the plates; on his return he

* Read before the London Photographic Society, December 8th.

would hand the negatives over to the photographic staff, who would develop and print them. The stereoscopic cameras would also be useful for ordinary manipulation, as the negatives produced are of sufficient size for most purposes, and are always capable of being enlarged if necessary.

The personnel of the equipment consisted of one chief photographer, Sergt. John Harrold, R.E., and seven assistants, all of whom belonged to the 10th Company Royal Engineers; besides photographers, the Company included men skilled as telegraphers, signallers, well-sinkers, &c., all of whom were under the orders of Lieut.-Colonel Pritchard, R.E.

The difficulties of working were sometimes very great, especially near the coast, and the experience gained will, in many cases, be of great value. The dark tent seems to have been the *bête-noire*; although no doubt very suitable for employment in a temperate climate, it proved for Abyssinian service exceedingly hot and close, and also very unsteady. Sergeant Harrold suggests that it would be a great improvement to furnish the same with guy ropes, for the purpose of rendering it firmer and more solid. The tent was several times blown down, and the covering continually flapping about from the effect of the sand-storms and strong mountain breezes, so that some difficulty was experienced in drying the pictures and in conducting the operations connected with printing. The fine sand blowing about was a most serious annoyance, as it was quite impossible to prevent it from penetrating the boxes, camera, and utensils; even the photographic solutions became contaminated with it, although the tent was kept so close and tight as almost to prevent breathing, the effect of being shut up in a confined space without light or ventilation on the glaring shores of the Red Sea being a sensation more easily conceived than described. For hot climates it would no doubt be better to construct the dark tent with a white or yellow outside covering, which would fail to absorb the heat rays in the same degree as an ordinary black tent. At Annesley Bay and Senafe especially, the heat was very intense, and great vigilance was necessary to preserve the collodion of the proper consistence, and to avoid the desiccation of the plate when taken from the bath.

The manner in which the collodion and iodizing solutions were stoppered was one which the chief photographer found to be very faulty; in some cases as much as half of the solutions had evaporated, and the remainder therefore required judicious doctoring. The best plan to secure these liquids would be to cork and seal up the bottles, a glass stopper being tied round the neck for employment after the vessel has once been opened.

The collodions sent out were of the usual descriptions at present in the market, and, on the whole, answered very well. For hot sunny climates, however, there can be no doubt that a liquid collodion should be selected especially rich in alcohol, and sensitized with salts which exert a liquefying action upon the material, as, for instance, the iodide and bromide of ammonium. It would appear, moreover, that a collodion which is not so very highly sensitive is best suited for employment in the tropics, and, if required for landscape purposes, it should contain a goodly proportion of bromide, in order to secure as much detail and half-tone as possible. To prepare a material of this kind it would be necessary to diminish the amount of sensitizing salts, as the rapidity with which a collodion works is governed mainly by the quantity of these salts contained in it; the proportion of bromide and iodide to be employed might soon be ascertained by a few experiments undertaken in the sunshine, but, according to Dr. Vogel, five equivalents of bromide to one of iodide may be used with good effect, provided an acid bath be employed to prevent the fogging of the negative.

(To be continued.)

A VISIT TO THE PHOTOGRAPHIC STUDIO OF THE IMPERIAL MILITARY GEOGRAPHICAL INSTITUTE IN VIENNA.

BY ALOIS NIGG.*

I WAS subsequently informed that in working with large plates it was quite impossible to coat the glass with collodion in the same manner as that adopted for those of a smaller description; if such a method were adopted, the glutinous mass would, by reason of its own weight, hang in folds towards the lower part of the plate, while it would be torn off altogether from the upper portion. For this reason the margin of the glass is roughened all round, so that a more perfect adherence may be effected; at the same time, a collodion is selected for employment which dries very slowly, and is likewise of not too thin a consistence, so that during the time it remains upon the plate in a horizontal position an equal distribution of the mass takes place.

The rest of the operation requires merely special skill in its performance, for it does not matter so much by which method one works, as what are the nature of the results obtained. The quality of the productions turned out by the Imperial Institute furnish the most satisfactory proofs that with the talent available, and the opportunity for continual practice in the most difficult operations, together with the efficient superintendence bestowed, success is sure to attend the labours of the staff, whatever may be the method pursued.

M. Fink works in a pair of india-rubber gloves, examining the plates in the light by holding them flat in his hands at the two opposite edges; by this means he but seldom soils the fingers during the elaboration of a negative.

During my visit at the Institute, Colonel Schopf was engaged in examining some proofs in the photo-zincographic department, and I regret, therefore, that I am unable to make known any of the important details relating thereunto. Without the quaintness of manipulation which characterizes M. Fink, M. Schopf works in a more quiet and precise manner, which always seems to suggest the most agreeable expectations of his continual researches. He was good enough to inform me that the employment of cyanide of potassium had been totally superseded in the Institute, by reason of the injurious vapour and poisonous smell to which it gives rise when used upon large surfaces. Even for the removal of silver stains upon the hands, cyanide of potassium has ceased to be employed, a concentrated solution of corrosive sublimate being found much more efficacious for the purpose.†

He informed me, likewise, that the positive paper used for printing is not rendered sensitive by floating upon nitrate of silver solution, but that the latter is applied to the surface of the paper by means of a brush, thus effecting a considerable saving in the preparation of so costly a liquid when dealing with prints of large size. A soft camel's-hair brush, not less than four inches broad, is used for the purpose, and at the lower margin of the paper are attached a few pieces of blotting-paper. The brushing over of the silver solution is repeated a second time as soon as the paper has become slightly dry, but while it is yet tolerably moist. This mode of operating would seem especially suitable for adoption by photographers whose work consists chiefly in the production of enlargements, for the results obtained by the method certainly leave nothing to be desired, provided care is taken that the sheet is washed over with the sensitizing solution to a sufficient degree.

During a recent discussion in photographic circles on the merits of the method of coating and preparing the plates just described, it was mentioned that this original manner of operating, although yielding good results in negatives where contrast is very great—as, for instance, in maps composed of black lines upon white ground—could scarcely be

* Continued from p. 593.

† We cannot but think that a strong solution of bichloride of mercury would be quite as injurious for application to the hands as cyanide of potassium.—Ed. P. N.

employed where delicate gradation or soft half-tone is required. To confute this argument I exhibited, at the last meeting of the Vienna Photographic Society, a large 30-inch negative, being a life-size portrait of the Baron v. Wertheim, which was prepared at my request from a print of equal size, and which proved in the clearest manner that the method might with advantage be adopted for the production of ordinary negatives.

When in any of the map-negatives there are found large empty spaces which print too transparently, or, in plates of coloured plans, certain portions which do not possess sufficient density, the glass in these cases is made more opaque by gumming upon the reverse side of the finished negative pieces of tracing-paper, which are cut by means of a sharp knife to the required outlines. In this way negatives of insufficient density are made to furnish prints of a very clear and even character. This method of increasing the opacity of the film I have modified somewhat for employment with large portrait negatives: I accurately cut out a piece of straw-paper on the back of the negative, according to the outlines, and afterwards attach it to the front of the plate over the varnish.

The composition of the solutions and formula used at this Institute have already been given in the *Correspondenz*. Not less important than the work performed in the photographic studio are the labours undertaken in the photolithographic and galvanoplastic departments; so that the establishment may be regarded in the highest sense as the cradle of multiplying arts.

ON INTENSIFYING NEGATIVES.

BY GEORGE H. FENNEMORE.*

A NUMBER of negatives have been shown me lately representing the work of some ten or fifteen different photographers. I was struck with the many different modes adopted to bring these negatives up to what was supposed to be the proper density for printing, by the use of intensifying agents. And I was both surprised and pained to see many negatives that really had a great deal of merit in them completely spoiled by the indiscriminate use of such agents as sulphuret of potassium, bichloride of mercury, iodide of mercury, &c. It seems to be that the one idea of a perfect negative was clear glass for the dark parts, and complete opacity for the whites. When will photographers learn that the only merit in intensifying is to produce tone; that is to say, a well-graduated balance between the highest points of light on the face, and the deepest shades on the drapery, the remainder being half-tone? The face of no picture should be white, because there is no pure white in the face of a living human being. When we see a person in a strong light there are certain spots of light on the face which appear to us to be nearly white; for instance, on the point and slightly extending up one side of the nose; one bright spot on each eye, and another on the forehead, if it be smooth. It follows, therefore, that the only points of pure white in a portrait should be (for instance, of a man with dark clothing) the shirt collar and bosom, the cuffs, and the catch-lights of the eye. Consequently, they should be the only parts showing perfect opacity in the negative. Suppose, for example, you have for a sitter a lady with a black velvet sacque and brown merino dress: do you think you can secure the proper degree of tone between the sacque and the dress, if you bring your negative anywhere near perfect opacity in those parts representing the face and hands of your sitter? Assuredly not. A brown merino dress will be quite dark in a picture, because it has not much power to reflect white light; but if taken in conjunction with black velvet, it will look comparatively light, because the velvet represents perfect black, and the dress does not. For making a negative of such a subject, the object should be to place the sitter in

such a light as will give a harmonious rendering of light and shade; expose sufficiently long to allow the developer to bring out the finest detail; and then, if necessary, intensify until the highest points of light in the face are sufficiently dense to keep the paper white until the printing is deep enough on the velvet to represent pure black. A print from such a negative will be bright and vigorous, and, at the same time, full of the most delicate detail and half-tone.

The question, then, arises, What is the best method of producing the desired result? Unquestionably the best negatives are those that have had a full exposure, and the proper amount of density brought out by the first development; but this cannot always be done, because, with the practical photographer, the conditions necessary to produce such a result are continually varying. With the amateur photographer it is somewhat different, because he can generally choose the time best calculated to give him the desired result; but those who have to make their living by the aid of the camera are obliged to manipulate at all times during the day, and under all conditions, which, as I said above, are continually varying. The light varies, and the subjects vary: first, perhaps, a full-grown person, then an infant a few months old; or you may have a young girl with a round face and pearly complexion, and afterwards an old man from the country, full of wrinkles, and sun-burnt and tanned almost to the colour of an Indian. This is no exaggeration; and I candidly ask those who tell us that after-intensification is only an excuse for bad manipulation, if they can come into a gallery and produce, from morning till night, perfect negatives with a single development? My experience tells me No; but I may be mistaken. But while I believe redevelopment and intensification necessary in many cases, I also consider that every endeavour should be used to produce a perfect negative without it.

One great fault among many operators is, that they do not stop to consider whether a negative requires to be redeveloped or intensified. This becomes such a confirmed habit with them that it is the general rule, and not the exception, and they are apt to abuse it. This is a great mistake, and will have much to do with making or marring the beauty of the print. For the sake of illustrating this point, let us begin an imaginary day's work. Our first sitter is a young girl with a fair complexion. We expose our plate, and get a good negative, perfect in light, shade, and half-tone. The next is an old man, wrinkled, and with a sallow complexion. We sit him the same time as the other. Do we get as perfect a negative? No; for the face lacks sufficient density, and the wrinkles show with painful distinctness. The proper remedy for such a negative is to try again, and give more time in exposing. This will allow the weaker radiations of light from the face to impress themselves upon the sensitive plate, thereby softening down the wrinkles, and making a much more pleasing picture. The negative is now very soft, but weak, and must be strengthened or intensified, the best mode of doing which I will explain below. Our next subject is an infant. We try two or three plates, perhaps, before we succeed in getting it still, even for a few seconds; we develop the plate, and find but little more than an ambrotype, but we feel satisfied to think we have got that much. But how shall we bring it up to something like-printing quality? By sulphuret of potassium or bichloride of mercury? Many of you will say, Yes. But I say, No: because the negative is still capable of having more of the detail brought out; and this can be done by taking a portion of your bath solution, and, after well washing the plate from the first development, flood it evenly with the silver solution, allow it to permeate the film thoroughly, drain well, and then flow over your iron solution again, or pyrogallie acid solution, which latter I prefer. Do not keep it on too long, or it may fog the plate. If it does not come up sufficiently, wash the plate well, and repeat the dose. In this way many a good negative may be made from short exposures.

The chief trouble in intensifying is caused by the impa-

* Philadelphia Photographer.

tience of the operator, who aims at getting it through in a hurry. To redevelop or intensify a negative properly, it should be done slowly, producing a fine, even deposit, only upon those parts already acted upon by the developer. This is done by adding a very small portion of silver to the pyrogallic acid, or iron, as the case may be. But many operators throw in the silver without much regard to quantity, thereby producing a very coarse and uneven deposit, and not unfrequently covering the whole negative with a red veil of reduced silver. Intensification, therefore, in careful hands, may be made to beautify, and, in careless hands, to destroy, the negative, according as it is properly or improperly practised.

In conclusion, I give my plan for redevelopment and intensifying. In the first place, I make my solutions as follows:—

Solution No. 1.

Pyrogallic acid	...	...	16 grains
Citric acid	...	...	24 "
Water	...	...	8 ounces.

Solution No. 2.

Nitrate of silver	...	...	25 grains
Water	...	...	1 ounce.

Solution No. 3.

A very weak solution of sulphuret of potassium, to be used as directed below.

For slightly under-exposed negatives I take half an ounce of solution No. 1, and add to it three or four drops of silver solution No. 2. This will remain on the plate a long time without decomposition. If the plate is fully exposed, I fix first, and, after well washing, intensify the same as above. If the plate is slightly over-exposed, or very weak and flat, I use, after fixing and washing, the weak solution of sulphuret of potassium, because that is an intensifier alone, and has no redeveloping qualities, and, consequently, is the best for over-exposed negatives. The above only applies to negatives that really need after-intensification, for, as said before, I never use any if I can get along without it.

I hope what I have written may benefit some of the less-experienced of my brother photographers.

MEANS OF EQUALIZING EXPOSURE WITH WIDE-ANGLE LENSES.

BY JOHN M. BLAKE.*

THE plan finally carried out in practice may be thus described:—In front of a Zentmayer lens a disk is suspended by means of fine wires stretched across a frame. This frame can be drawn out parallel to the axis of the lens. The object is to shade the centre of the field while the borders are receiving the necessary amount of exposure. Now, provided we know the time required for each portion of the field, and can give the disk a steady and regulated movement, finally removing it altogether from before the lens, we can control the distribution of actinic action as we desire.

On trial, the steady movement of the disk was found unnecessary. Four separate adjustments gave no visible ring on the plate when using the Zentmayer lens, provided that in the first position the disk was as near the lens as the mounting would admit.

The first object sought in deciding on these positions was to make them answer to times which would be simple fractions of that required for central exposure. In case we wish to expose the limits of a field of 85° three times that which the centre requires to give the best results, we may take such successive positions for our disk that, first, its shadow shall cover a circular field of 74°, and expose the annular portion outside this once the time required for the centre. Second, move the disk until its shadow on the plate subtends 58°. The illuminated ring outside this is now ex-

posed one-half, as above. Third, the shadow measuring 44°, time, one-quarter. Fourth, shadow 20°, time one-quarter. Fifth, the disk is removed altogether, and the whole plate given the time of central exposure.

The above adjustments and times may give as good an equalization of exposure as the necessities of the case require. If we include a less angle at the corners of our plate than given above, we may commence with the second or third position, and, of course, shorten the whole time accordingly.

If it is thought three times the central exposure is not sufficient for the borders, we may arrange for four times this, as follows:—Shadow of disk, 76°, time one; 64°, one; 48°, one-half; 34°, one-quarter; 15°, one-quarter; whole plate, one. This makes six adjustments, if we count the removal as one.

The above estimates are only given as approximations, sufficiently exact for practical purposes. A curve was plotted, representing the calculated times required for different parts of the field, and the best adjustments of the screen for the given intervals of time found by measurements from this curve. The tendency to form a ring on the plate is greatest when the disk is farthest removed from the lens, since its shadow is then more sharply defined, and, also, because the intervals are shorter, and more exact timing is necessary.

The centre can be exposed first or last, as is most convenient, and, provided we succeed in locating objects liable to move in the centre of the field, we actually increase the efficiency of a wide-angle lens in respect to quickness in working; for the centre of the field can actually be exposed a less time when this method of equalizing exposure is employed than is possible when we would get the best general effect over the whole field in the ordinary way.

As an additional refinement, it may be suggested that the disk should be inside the camera between the lens and plate. In this position it will not itself become, to some extent, a luminous object, for it will be effectually shaded. Further than this, when it is outside and shading the centre of the plate, this portion is unnecessarily subjected, during the whole exposure, to light reflected between the two lenses of a double combination. Although, in the lens used in my experiment, this reflected light was so distributed by the arrangement, of curves as not to come to a focus on the plate, and thus form a central spot, and was as small in amount as it is, perhaps, possible to attain in any combination, there was a slight fogging near the middle of the plate, visible on an otherwise perfectly clear negative, when viewed by reflected light, the effect of which was to make negatives taken with an equalized exposure print more slowly near their centre than negatives produced in the ordinary way, having equivalent central exposure. This unwelcome light, which, with my lens, I consider mostly due to the luminosity of the disk, was isolated by exposing the outer portions of the plate the amounts above given, omitting the final exposure of the whole plate, thus leaving a circular spot at the centre of the latter, which ought to have been clear glass, but by reflected light it showed fog. Measures were taken to prevent blurring, and all other sources of fog were absent, for the borders of the plate showed perfectly clear glass on several repetitions of the experiment. At the most, this fog is slight, to be discovered only under favourable conditions. The lens gave no detectable fog in an ordinary exposure (for instance, over a dark interior, near the centre of the plate). The front of the lens and disk were shaded, as much as practicable, by a box. This box was necessarily shallow, on account of the wide angle.

An internal central screen would reduce this fog to a minimum, if due to the operation of either cause. The mechanical difficulties in the way of adjusting and removing it are, however, much increased in this situation.

I have not yet completed an arrangement by which I hope to accomplish this object. A large plate can be rotated back of the lenses in a stereo-camera box. This plate is provided with a double set of disks of different sizes, suspended in apertures which are brought in succession opposite the

* Continued from p. 595.

lenses. While this should accomplish the same object as the plan actually used, and have the advantages mentioned, there will be an additional gain, inasmuch as the shadow of the screen will be less sharply defined; and hence we may do with fewer adjustments than above given, so far as the formation of a visible ring on the plate is concerned.

The difficulties in the way of perfecting the last-mentioned arrangement are tenfold greater than in case of the external screen.

THE CAUSE OF PINHOLES IN DRY PLATES.

BY SEBASTIAN DAVIS.

[The following remarks were made by Mr. Davis in introducing a subject from the "Question Box" at the last South London meeting.]

At a recent meeting of the Committee of this Society it was deemed advisable to proceed with the discussion of the several "queries" which have been proposed and accepted for consideration. In order to give a more useful character to their discussion than would be likely to follow from their casual introduction, it was decided that different members should be deputed to introduce them to the attention of the Society, with remarks upon the general subject to which they respectively refer. By following this method, it is hoped that many technical questions of practical photographic interest may receive elucidation, and means of avoiding difficulties that militate against success devised.

The subject that I have to bring before you this evening is that of the causes that lead to the occurrence of "pinholes" in dry-plate photography. It is quite certain, however, that the question cannot be regarded as having an exclusive connection with dry-plate practice, but has also an intimate association with similar appearances that are occasionally met with in the wet. It is possible, however, to have plates in which this annoyance occurs abundantly, arising from causes confined to the after preparation of the films, when, with the same collodion and bath, it would not occur if the plate were immediately exposed upon removal from the nitrate of silver solution. The subject is especially vexatious in either instance, because it is almost impossible to remedy the defect in the finished negative by the most skilful hand treatment. If the pinholes be examined under a magnifier they will generally be found to present two distinct characteristic features: the one, a circular transparent ring around a small opaque spot; and the other, irregular patches of transparency.

The causes which produce these pinholes are doubtless manifold; some understood, others yet to be explained. One of the first for consideration, and to which I have distinctly traced their occasional appearance, consists in the existence of small particles of insoluble matter in the collodion itself, which refuse to deposit even after prolonged standing, and cannot therefore be eliminated by simple decantation. In this case it is necessary to filter. To accomplish this with the smallest possible loss from evaporation, and through ordinary filtering-paper, I have designed and constantly used a simple apparatus, which I find so efficient and useful that I do not hesitate to introduce it to your attention. It consists of a funnel with a large and short stem, over which is fitted an elastic flat ring, so as to secure an air-tight connection through the neck of the bottle which is to receive the filtrate. Into this funnel is placed a smaller one with a longer stem, and held in its place within the larger by a circular disk of wood with grooves cut in its outer surface, in order to maintain a communication between the space below and above the inner funnel. Over the surface of the outer funnel is placed an air-tight removable cover, or its upper edge can be ground flat, and a piece of plate glass be placed thereupon, with a small weight to keep the two in contact. By this inexpensive arrangement, collodion or any other ethereal liquid can be efficiently filtered without sensible loss from evaporation, and its use will oftentimes prove valuable in ensuring an immunity from pinholes.

I now come, in the second place, to that which I regard as a more general cause of their existence, and the one which has an immediate bearing upon their appearance in dry-plate photography, viz., the method employed for removing the free nitrate of silver solution from the film. The process generally adopted is to allow the plate to remain in ordinary or distilled water for a certain length of time after it has

been rocked to and fro therein, until the liquid freely flows over its surface. The use of ordinary, or even filtered rain-water has been condemned for this purpose, in consequence of the insoluble salts of silver produced by the reaction, and which naturally adhere to the surface of the film. My own observations lead me to conclude that when once this has taken place, no amount of subsequent washing, even with water falling upon the film with considerable force, will entirely detach the insensitive particles deposited. But I am desirous of especially calling attention, at this stage of the enquiry, to the fact that the use of distilled water, even if chemically pure, does not prevent the formation of a precipitate, and consequently that the plate, even when treated with such, should not be allowed to remain at rest until the whole of the free nitrate of silver bath solution has been removed. The precipitate to which I allude is produced by the simple dilution of the nitrate bath holding iodide or bromide of silver in solution. The disregard of this reaction has been, I feel convinced, a fruitful source of difficulty, and has led many to the conclusion that the use of distilled water in preparing a dry plate is unaccompanied with any corresponding advantage. My recommendation is, therefore, that when the free silver is to be removed from an excited collodion film, the plate should be washed once or twice in pure water with constant agitation, and that on no account should the plate remain stationary therein until the whole of the free bath solution has been removed.

In the last place I have to refer briefly to the action of a prolonged treatment of the film with a developer containing citric acid upon the darkened salts of silver, as a fruitful source of pinholes. This prolonged development is sometimes rendered necessary in consequence of under-exposure, and the result is that the superficially deposited salts upon the denser parts of the negative are displaced by the solvent power of the developer itself, or the subsequent action of the fixing solution. The pinholes so produced are those of an irregular outline, referred to in my earlier remarks. There are doubtless other causes connected with the presence of pinholes than those to which I have referred—such as the condition of the bath, the microscopic texture of the plate glass, &c.—but my experience leads me to infer that if, as recommended, the collodion be once filtered, some little time after it has been sensitized, the free silver be removed from the plate with distilled water constantly agitated, acetic acid be substituted for citric in the developer, and the necessity for its prolonged action be avoided, the principal causes of pinholes in dry-plate photography will be evaded.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

A popular meeting of this Society was held in Queen Street Hall, on the evening of Wednesday, December 9th, at which a very large attendance of members and their friends were present. A number of Mr. Stuart's, of Hammersmith, fine transparencies of English cathedrals and abbeys were exhibited by the Society's oxyhydrogen lantern; and the subjects were described and explained by the president of the society, Sheriff Hallard. At the close of the meeting an enthusiastic vote of thanks was passed to Messrs. Stuart and Hallard for their services to the Society.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held in the City of London College on the evening of Thursday, December 10th, the Rev. F. F. STATHAM, M.A., in the chair.

The minutes of a previous meeting were read and confirmed, and Mr. J. Gale was elected a member of the Society.

Mr. WHARTON SIMPSON exhibited a number of Mr. Blair's fine specimens of carbon printing by the single transfer process, and without any transfer whatever, both possessing good half-tone. They were examined with much interest, and some conversation thereon followed. Mr. Simpson also exhibited a fine example of M. Salomon's portraiture, which excited much admiration. He also exhibited some examples of Carl Meinerth's photo-mezzotint printing, an example of Dr. Liesegang's paper pyroxyline, and a collodio-chloride print, the collodion of which was made from this pyroxyline. After some further conversation on the various specimens,

Mr. SIMPSON further called attention to some examples of a new style of mounting-board just introduced by Mr. Fox (see p. 602). After some conversation, and approval of the effect of the mounts,

Mr. COCKING exhibited a number of interesting specimens containing fine cloud effects. The subjects were chiefly in Lahore, taken by Major Bamfield.

Mr. How exhibited a fine frame of photographic magic lantern slides. The subjects were various, many of them being very beautiful, and all excellent in execution. Mr. How stated that, with a view to introduce photographic transparencies for the lantern in place of the less perfect painted slides, he was enabled to issue these at a much lower price than such things had ever been published before.

After some conversation on the subject, Mr. How promised to give an exhibition of these slides by means of the magic lantern at the January meeting of the Society.

Mr. GAMMAGE exhibited Mr. Browning's new economic electric lamp, a good steady light being obtained by means of six cells of a Grove's battery. He explained and illustrated the working of the automatic arrangement by which the proper position of the points was maintained during the combustion.

Mr. SEBASTIAN DAVIS then introduced for discussion a subject from the "Question Box," in which the cause of pinholes in dry plates was discussed (see p. 608). In the course of his remarks he exhibited a very simple and efficient collodion filter.

Mr. HOWARD said that his experience confirmed that of Mr. Davis as to the impropriety of washing the prepared plate without keeping it in motion, so as to prevent the deposit of chloride or insoluble salt of silver precipitated in washing adhering to the film. He thought the immunity of collodion-albumen plates from pinholes arose from the character of the albumen surface, to which particles precipitated did not adhere as they did to a collodion film.

Mr. TAYLOR asked Mr. Davis if he had considered the action of excess of nitro-iodide of silver in the bath as a cause of pinholes.

Mr. DAVIS said he had not done so especially. He presumed that at the outset the bath would be properly filtered.

Mr. HART described a sample of nitrate bath brought to him to test, which registered 36 grains to the ounce by the argentometer, and was found, by means of his volumetric apparatus, to contain 53 grains. He could see it full of fine needle-like crystals floating about, but it was stated that no pinholes resulted.

Mr. SIMPSON remarked that if the floating crystals were nitro-iodide of silver, it must have been singularly surcharged, as a bath of that strength would keep a large quantity in perfect solution without crystallization.

After a desultory conversation on the subject,

Mr. DAVIS said he felt that especial attention was due to the effect of washing in distilled water, occasionally precipitating iodide of silver on the film by the dilution of the free nitrate it produced; and most persons imagined that if they used distilled water they were quite safe from the risk of precipitating insoluble salts.

Mr. SIMPSON said that this observation was clearly important, and he believed that it had not been made before. The use of a dipping-bath would, however, be valuable, as it would tend to remove all precipitates from the plate, whilst horizontal washing might aid in attaching them to the film.

After some further conversation the proceedings terminated.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 6th ult., M. BALARD, president, in the chair.

M. CONSTANT-DELESSERT placed at the disposition of the Society several copies of his recently published pamphlet, entitled "Researches on the Dry-Collodion Processes."

M. VINOIS read a short communication on the renovation of glass in studios. He said, Much has been written respecting the lighting of photographic studios, but nobody has, as far as I know, studied the alterations produced upon glass by sun and rain, or suggested a means of repairing the bad effects caused by the same. It is well known that when glass is exposed to the influences mentioned, it undergoes a certain change, which occurs more or less rapidly, according to the greater or less amount of potash or soda in its composition, the surface presenting a matt appearance, which much resembles ground

glass. To restore glass of this description to its pristine translucency, it is simply necessary to clean the surface with ordinary muriatic acid, diluted to a more or less degree with water, according to the extent to which the glass has become discoloured; the latter being subsequently treated with Spanish white mixed with water, and finally thoroughly cleaned. By this means I have cleaned glass, and rendered it again as good as new, which was so opaque that it was impossible to see through it; the method may also be used for renovating glass plates which have suffered much from frequent employment.

M. PELIGOT stated that this was, no doubt, the first time that muriatic acid had been proposed for cleaning photographer's glass, but its employment was suggested for similar purposes by M. Bernard, who patented its application, and exhibited results at the recent Paris Exhibition.

M. DAVANNE reminded photographers of the fact that muriatic acid attacks and dissolves metallic substances, such as iron and zinc, which are generally used for framing the glass.

M. VINOIS also communicated a formula for making a negative varnish, which he had used for upwards of ten years with great success. The varnish must, it is true, be applied upon a warm surface, but it possesses the advantage of resisting a very high temperature, and does not affect the transparency of the negatives. It is composed of—

Alcohol	100 cub. cents.
Gum sandrac	10 grammes
Benzoin	10 "
Gum elemi... ..	10 "

The materials are dissolved upon a water bath, and the solution clarified by standing, and decanted; the negative is slightly warmed before application, and afterwards dried at the fire.

M. DAVANNE feared that the proportion of gum elemi, which had a softening effect upon varnishes, was somewhat large.

M. JOAQUIM INSLEY PACHECHO addressed a communication from Rio Janeiro, calling attention to the appearance of some prints which he forwarded, and which were covered with minute white spots. M. Pachecho had read in the *Bulletin* an account of these disagreeable appearances, which were stated to be due to the presence of fine particles of bronze powder upon the mounting-board. To this M. Pachecho demurred, inasmuch as the imperfections observed by him were upon cards bearing no gilt ornamentation, but upon mounts with coloured borders. He was disposed to believe the effect was due to something injurious contained in the colouring matter, or in the paper pulp, for his large prints, which were mounted on Bristol board supplied to him by the same manufacturer, were free from any of these injuries.

M. DAVANNE adhered firmly to his opinion as to the origin of the spots, and believed that, inasmuch as many manufacturers preserved their gilt and coloured cards in the same workshop, it was not unlikely that some of the bronze dust became detached, and adhered to the other ornamental boards.

M. DESPAQUIS exhibited a collection of carbon prints mounted as transparencies, and produced by means of his collodion-cuir. He likewise read a short note on the subject.

M. DESPAQUIS suggested that in M. Marion's method of transporting the carbon print by means of an albuminized surface coagulated by heat, it would be an improvement to use a more impermeable basis, to prevent staining; as, for instance, tinfoil, dioptric paper, tracing-cloth, &c.

M. CONSTANT-DELESSERT forwarded an interesting paper on dry plate processes, accompanying the same with specimens.

The PRESIDENT stated that he had been requested by Mr. Warren de la Rue to say that certain photographs obtained in natural colours by M. Edmond Becquerel, eleven years ago, had been left to Mr. de la Rue by the late Professor Faraday, and that the colours were still perfectly vivid, although Faraday had frequently exhibited them and exposed them to light.

MM. GEYMER and ALKER exhibited the process of producing photographic enamels, starting with an unsensitized glass plate, and finishing with the perfect enamel. A solution composed of honey, sugar, gum, and bichromate of ammonia, dissolved in water, was poured upon a well-cleaned glass plate, and dried. On this dry plate a good *positive* was placed, and exposed to a magnesium light for a few seconds; the enamel powder was then brushed over the surface, attaching itself to those parts which had been preserved wholly or partially from the light. The print, thus developed, was covered with ordinary normal

collodion, and then plunged into a very dilute bath of sulphuric and hydrochloric acid; after immersion for several minutes the plate was placed in pure water, when the pellicle with the image became detached, and was transferred to a solution of sugar. Under the film was placed the material which was to be heated, in such a manner that the enamel-powder was undermost, and the whole was then drained and thoroughly dried; subsequently it was placed in a sulphuric acid bath, to destroy the collodion, and, after a few minutes, withdrawn, washed, and again dried. After the image had been somewhat touched up, it was put upon a piece of baked clay, placed to warm for a few moments before the muffled furnace, and afterwards introduced therein when the latter was at a red-heat. In a minute or two the enamel became brilliant, and was then withdrawn and allowed to cool gradually.

M. GEYMER likewise read a paper describing the process, and pointing out the difficulties and liabilities of failure; he also alluded to several modifications which might be made in the method. The production of photographs, either upon enamel, porcelain, or glass, could be undertaken without the aid of any special appliances with the exception of an enamel-furnace, which might always find place in a corner of the studio.

The proceedings then terminated.

Correspondence.

LUX GRAPHICUS ON THE WING.

THE REFUNDING OF THE BALANCE OF THE GODDARD FUND—THE PHOTOGRAPHER'S PROVIDENT SOCIETY—A FEROCIOUS DOORSMAN—THE SOUTH LONDON DINNER—A CHRISTMAS CAROL.

MY DEAR SIR,—Now that the balance of the Goddard Fund is returned to the contributors, and all the trials and vexations the administration of the fund brought upon the chief promoters are known, I think the very best thanks of the whole body of subscribers to that fund are due to the committee for their firm and sensible determination to provide for the wants of the poor imbecile recipient in the manner they did, and for their withstanding the attempt made by a person who was not in the least related to the late Mr. Goddard to obtain possession of the balance in hand. I, for one, a subscriber to the fund, return them my most hearty acknowledgements, not for the money returned to me, but for the straightforwardness of their report, and the wise and judicious manner in which they dispensed the funds. While congratulating myself and confreres on seeing the money not required for the relief of the late Mr. Goddard returned to the subscribers instead of going into the possession of a person for whom it never was intended, I think it is to be regretted that no responsible party had foreseen that much of this returned money would have been gladly placed to the credit of some benevolent or provident institution connected with photography. The whole amount, or even the half of it, would have made a very handsome nucleus for the commencement of such a fund. I have heard several wishes to that effect expressed during the last few days. Doubtless the committee did the very best thing they could have done for their own credit and the entire satisfaction of the whole of the subscribers; but I am afraid an opportunity has been lost in the interest of the incipient relief fund by not having had a receiver for these stray and unexpected sums appointed. The praiseworthy act of Messrs. Ross and Pingle, as noticed in another journal, confirms this impression.

While the subject of a photographer's provident or relief fund is before me, I may mention that in the Report of the Friendly Societies recently issued by Mr. Tidd Pratt, he speaks in the highest terms of those societies which are managed by the members themselves without salaries, and condemns the extravagance exhibited by the societies of a similar nature which are conducted by salaried officials. Now, as it is a friendly society pure and simple that sick or needy photographers ought to look to for future help, in

my opinion the former is the kind of society that should be established. The movement is not to be started as a business speculation, and there should be no salaries attached to any of the offices. Each member joining the provident society should be prepared to submit to the tax on his time and energies, if elected to office, as part and parcel of the amount he subscribes for the general welfare of the body and relief of individual members. For my part, I object to the contemplated society taking the form of a relief fund depending upon donations, collections at dinners, &c., for its support. Such means for raising the necessary funds to start the society may be allowable; but, after it is commenced, every individual connected with it should be a subscribing member, and not allowed to receive any benefit, except under the most urgent necessities, until he has paid a certain number of subscriptions.

During one of my peregrinations about town lately I stumbled upon a very ferocious doorman. My attention was suddenly arrested, while passing one of those photographic establishments which keep a kind of two-legged hyena prowling up and down before their doors, by hearing the somewhat startling and cannibalistic exclamation of "I'll eat yer!" Looking round, I saw that one of those prowling bipeds had fastened upon two quiet-looking young gentlemen, evidently strangers in town and to town ways, and had so importuned them to sit for "a correct likeness," until they turned upon him, and threatened to give him in charge if he did not desist; when he retaliated by threatening to eat them, and used a great deal of sanguinary and abusive language as a substitute for more palatable suavity. Is such an "outsider" or hanger-on a fit and proper person to join a photographer's provident society, or be the recipient of a benevolent relief fund?

The South London Photographic Society's annual dinner came off on Saturday evening last at the "Salutation Tavern," Newgate Street. Twenty-three members and friends, all told, sat down to dinner, and enjoyed a thoroughly English repast. After the cloth was removed, the pleasantest part of the evening commenced. The worthy and honoured president, who occupied the chair, was all geniality, and gave the toast of the evening—"The South London Photographic Society"—in his usually felicitous style. To Mr. Jabez Hughes was allotted the task of proposing the next important toast—"Photography"—which he did in the most glowing and eloquent terms, dwelling on the rise and progress of the art in England, its position in a competitive point of view at the Paris Exhibition, interspersed with some racy and facetious remarks on the different modes and kinds of rewards, from the bronze, silver, and gold medals, to the paper certificates, which he considered the most honourable mentions that could be given by a discerning public. From that he soared into the higher aspirations of photographers and sublime regions of photography, giving, with thrilling effect, a description of the social joys, scientific pursuits, and human ameliorations to which photography administers. Mr. Baynham Jones, being the oldest photographer present, had the honour of replying on behalf of the art. Mr. G. Wharton Simpson, in very appropriate terms, gave the toast, "Art Photography," which was responded to by Mr. O. G. Rejlander. Mr. Johnson, of the Autotype Company, had the honour of proposing the toast "Professional Photography," which was responded to by Mr. Valentine Blanchard, who occupied the vice-chair. Other toasts of a professional and semi-professional character were given and responded to. The intervals were filled up with part and instrumental music by members of the Society. Mr. Cooper contributed greatly to the evening's enjoyment by giving two charming performances on the cornet-à piston, which were admirably accompanied by Mr. Henry Cooper on the piano. Taking it all in all, it was one of the pleasantest and merriest evenings I have ever enjoyed at the convivial meetings of the South London Photographic Society, and formed a delightful introduction to the season of universal festivity which is close at hand.

Christmas, all over the civilized world, is not only a period of festive reunion, but, according to the only rational interpretation of the word, a time of good will towards men, and peace upon earth. Photographers, like other men, have had their little differences of opinion, which have produced partial estrangements during a portion of the year which will so soon expire; but let the approaching season, which is held in commemoration of the birth of the greatest Peacemaker that ever came among men, be looked upon by all as the fittest time to forget and forgive all slights, injuries, or insults, real or imaginary; and let not the great festival of our common faith be clouded or eclipsed by an angry thought, nor the immeasurable charity of true Christianity be dimmed by one unforgiving feeling. The light of the Christian faith is a light that should penetrate to the dark cells of our hearts, and dispel all the gloomy and corrosive accumulations of controversy that may have lodged there, and unconsciously eaten away any part of our better nature. Few of us—none but the most presumptuous—can lay his hand upon his heart and say, "Mine is immaculate!" None of us are without sin, and charity and forgiveness are the greatest of the Christian virtues; and they should be the more carefully studied and practised by all who live in, and by the Light of the world.—Yours, very truly,

December 15th, 1868.

LUX GRAPHICUS.

Talk in the Studio.

THE SOUTH LONDON ANNUAL DINNER.—The South London Photographic Society is, we believe, the only photographic organization which indulges in the enjoyment of an annual dinner; but the complete satisfaction and success which attend these social reunions each winter are sufficient to warrant a recommendation of the example as worthy of imitation. On Saturday evening last, the members of the South London dined together at the Salutation Tavern, where they had a capital dinner, and a delightful evening. The Rev. F. F. Statham, M.A., occupied the chair, and Mr. Blanchard the vice-chair. Some excellent speeches were made, and some fine glees, songs, and instrumental solos, materially added to the pleasures of the evening. The speech of Mr. Hughes, in proposing "Photography," was a grand piece of oratory, and Mr. Baynam Jones, whose name was associated with the toast, interested the meeting by a reminiscence of his efforts to take a Daguerreotype in the first year of the discovery, before he had seen a specimen; in the absence of Daguerreotype plates he had to polish a portion of a silver waiter, to make a plate for his experimental operations; Mr. Howard responded ably on behalf of the South London Society; Mr. Wharton Simpson proposed "Art Photography," and Mr. Rejlander responded; Mr. Johnson proposed "Professional Photography," and Mr. Blanchard responded; Mr. Cocking proposed the "Photographic Press," by which he said he wished especially to be understood as referring to the respectable and trustworthy portion of the photographic press, and not the disreputable and untrustworthy, and Mr. Simpson and Mr. Taylor responded; Mr. How proposed the "Guests," and Mr. Greenwood, Mr. Whiting, Mr. Pritchard, and Mr. Mills responded. The officers of the Society, the musicians, and some other toasts, all received due honour, and midnight closed a very happy evening. A photographic comic song, composed for the occasion, was sung, which we shall probably print when occasion serves.

NEW WHITE PIGMENT.—The *Times* states that a new pigment has been discovered in some lead mines in New Jersey, United States, which consists of an intimate natural mixture of zinc and lead, and is termed plumbate of zinc. A certificate of its qualities has been obtained from the School of Mines, Columbia College, some of which are entirely wanting in the artificial mixtures. In comparison with the other pigments in general use, it is stated to possess the following peculiarities:—1. Owing to its great opacity, it covers much better than pure oxide of zinc, or the best white lead; 2. it covers more surface, weight for weight; 3. it makes a harder and more durable coating; 4. it will wear much longer when exposed to the weather on outside work; and, 5. it resists for a greater length of time the action of sulphuretted hydrogen and other dele-

terious gases which so quickly discolour white lead. At the same time its cost is considerably less.

CHEAP MAGNESIUM.—A writer in the *Builder* says:—"There is now a fair prospect of a reduction in the price of magnesium through some recent improvements in its manufacture, and it is probable that in the course of next year we shall see the metal retailed at or under one shilling per ounce."

PHOTOGRAPHIC PAPER.—A contemporary states that a prize of 2,000 fr. has been offered in France for the production of the best photographic paper. The prize will be awarded in 1869.

A NEWLY-DISCOVERED PROPERTY OF GUN-COTTON.—It has been found that the explosive force of gun-cotton may, like that of nitro-glycerine, be developed by the exposure of the substance to the sudden concussion produced by a detonation; and that it exploded by that agency the suddenness and consequent violence of its action greatly exceed that of its explosion by means of a highly heated body or flame. This is a most important discovery, and one which invests gun-cotton with totally new and valuable characteristics; for it follows, as recent experiments have fully demonstrated, that gun-cotton, even when freely exposed to air, may be made to explode with destructive violence, apparently not inferior to that of nitro-glycerine, simply by employing for its explosion a fuze to which is attached a small detonating charge.—*Pall Mall Gazette*.

A HINT TO LECTURERS.—Many lecturers have felt how unsatisfactory it is to write or draw, or in any manner attempt to illustrate their ideas, in a large room. Professor Albert R. Leeds, of Haverford College, Pa., suggests that this difficulty may be overcome thus:—A plate of glass is placed in the lime-light or magnesium lantern, and an inverting prism is put in the forward part of the draw-tube of the objective. If, now, while lecturing, writing is done with an ordinary pen and Indian-ink upon the glass plate, proceeding from left to right upon the plate, it will advance correspondingly upon the screen, and will be read in greatly enlarged characters by those present. The square prism inverts with respect to bottom, and the writing being actually reversed by the writer in reference to the other direction in which the lantern is pointing, the crossing of the rays produced by the lens becomes in this case an advantage, and corrects the letters upon the screen. A collodion film, blackened by exposure to the sun's rays, may be substituted for a naked glass plate with great advantage. On such a film chemical and mathematical formulae, drawings of apparatus, machinery, and so on, may be cut with delicacy, and appear as intensely bright white lines on a black ground, and with something of the appearance of an immenso copper-plate engraving.—*The Builder*.

To Correspondents.

TO AGENTS AND ADVERTISERS.—Next Friday being Christmas Day, the PHOTOGRAPHIC NEWS will be published on Thursday December 24th. Advertisers should send in their Announcements not later than Wednesday, the 23rd.

OXONIENSIS.—We do not belong to the Amateur Photographic Association, and cannot speak with authority of its internal economy. The classification, so far as we believe, is regulated by the size of the pictures, not by the subjects. Members subscribe a guinea a year, and send in for printing not less than half a dozen negatives. They are entitled for this to two guineas' worth of pictures, and to half the profits on any sales of prints from their negatives. There is a rule that negatives which receive the prizes become the property of the Association; but there is also a condition that the owner of a valuable negative may decline to part with it on such terms. Whether by so doing he would forego all chance of a prize or not we cannot tell. As an outside observer, our impression is that, on the whole, the working of the Association has been beneficial to photography. 2. The object of the instruction that the plate should remain ten minutes at least in the bath is to ensure the perfect change of the extra proportion of bromide the collodion contains into bromide of silver. The double decomposition between bromides and nitrate of silver is not so rapidly effected as between iodides and nitrate of silver; hence, in any process in which a large portion of a bromide is employed, it becomes desirable to use a strong nitrate bath and give a long immersion. The use of two or three baths would economise time. If varnishing round the edge do not secure the film, a preliminary dilute coating of india-rubber, either in pure benzole or chloroform

may be used. In such case it is important to give full exposure, or the preliminary coating will act like a dirty plate, causing markings to appear in development. 3. We have seen many pictures produced by the lens you name, and have heard the opinions of many able photographers. They all state it to be one of the most valuable lenses ever introduced, and, for the class of lens, very rapid. Our own trials have only been experimental, but they were very satisfactory.

C. COLLODION.—The amount of soaking in warm water necessary to unmount prints from cardboard should not reduce the tone or brilliancy of the pictures. We know of no better plan than soaking in warm water. Placing a piece of wet blotting-paper over the print will sometimes serve to soften the adhesive material sufficiently, but more time is required. 2. The lens to which you refer will serve for 10 by 8 pictures, and, with a very small stop, for 12 by 10. 3. Either is good; we cannot with certainty say which is best for landscape work.

W. G.—In separating grape sugar from honey by means of alcohol, it is simply necessary to wash the honey with the spirit to remove the soluble syrupy substance, the hard crystalline residue being the grape sugar.

A. LEARNER.—Hypo-sulphite of soda may, of course, be used for fixing instead of cyanide, and is in many respects best. For collodion positives cyanide is preferable, as giving a better colour. 2. A porcelain pan is better for most purposes than one of gutta-percha; the latter has the advantage of permitting, by its colour, the progress of fixing collodion positives to be watched. If a negative (or positive) be left long in a cyanide bath, the image will quickly be dissolved; in hypo-sulphite of soda there is no danger. 3. The guide for determining when a plate has been a sufficient time in the silver bath is generally its appearance. When the solution flows freely over it without greasy lines, and the plate looks even and creamy, it is judged to be ready for use. As a rule, 2 or 3 minutes in summer, and 3, or 4, or 5, in winter, are sufficient with ordinary materials. Various evils result from leaving the plate too long in the bath: sometimes a portion of the iodide of silver formed is redissolved; sometimes crystals of iodo-nitrate of silver crystallize on its surface, and cause pinholes; sometimes fog is the result. 4. Under-exposure of the negative is the common cause of the face being too dark; sometimes, of course, it arises from over-printing.

SUBSCRIBER FOR YEARS.—We do not know anything better than a good magic lantern condenser for using for enlargement with artificial light.

P.—The print you enclose is a very bad sample of a very troublesome defect, cases of which are frequently brought under our attention. We cannot arrive at any absolute certainty of the cause. We have often been inclined to believe that the formation of minute air-bubbles on the paper whilst in the fixing bath, causing imperfect fixation, is the cause; but, not having met with the defect in our own practice, we cannot with certainty trace the defect to that cause.

J. MAYCOCK.—The prints seem good; but whether they are absolutely perfect reproductions we cannot, of course, say, without a comparison with the original. No. 3 seems as if the negative were just a little under-exposed. 1. A thick lac varnish is very excellent. Repeated applications of wax or paraffine have been recommended. 2. The use of a strong bath is conducive to the formation of matt silver stains, and weakening the bath a little is often a cure. Take care to wash the inner frames of the dark slide frequently. 3. A small portion of bromide of silver is soluble in bromo-iodized collodion; the collodion should be decanted from any insoluble residue. 4. Members of the Amateur Photographic Association pay a guinea a year, and receive two guineas' worth of prints. 5. The pinkish purple tone to which you refer is best obtained with a bath of sulphocyanide of gold. We have not tried the addition of chlorate of potash. Thanks, and reciprocation of kind greetings. We shall doubtless hear of the working of the oxymel process.

K.—The name and address of the proprietor, and the date of publication, are necessary on an engraving, to secure the copyright. Copyright in illustrations in books goes with the copyright of the book, and permission to copy them should be obtained. There are many Copyright Acts relating to different things; some for engravings, some for books, some for paintings and photographs. All of them can be obtained at the publishing office for Acts of Parliament in New Street, E.C. There are no means of determining what is copyright and what is not, without much research. Some publishers will give permission for their engravings to be copied for the lantern, and some will not. A black tone for transparencies is often obtained by using a sulphide. See our last and the forthcoming YEAR-BOOKS. All aniline colours are derivatives of coal tar, and consist of different compounds of aniline and some other body, and each requires different treatment.

W. J. A. G.—It is unfortunate that your prints have been spotted-

out before mounting, as that not only renders it dangerous to use dampness as a means of making them lie flat, but will cause risk of injury in mounting. Try rolling them in the other direction, and keeping them in that position for a few hours.

ARCHER CLARKE.—We shall have some remarks on the subject shortly. It will be much more difficult to form a Provident Society than it will be to form a Benevolent Fund. 2. We do not know personally the gentleman you name.

X. X.—Your negative requires a little more intensity; but the print you enclose would not be bad if the background were clean. To get a fine tone you require a more forcible negative than that you have been using.

LANDSCAPE.—Our time is too closely occupied to permit us to answer photographic questions privately. 2. We prefer No. 1. 3. A is most suitable for landscape and general work. 4. After this year photographers can obtain poisonous chemicals only of a pharmaceutical chemist.

D. O. N. E.—To succeed in producing opal pictures by camera printing requires experience. The defects you describe are due, probably, to over-development. Either over-exposure or over-development will produce such a result; but it is most commonly due to the latter. The development should be much more rapidly effected than the operation of developing a negative. Read the article which appeared in our pages on the eburneum process, last September. All the manipulations of producing the picture should be the same for opal glass. You will find it easier, in working with opal glass, to get good pictures by the collodion-chloride process.

PATRICK O'CONNOR.—We perfectly understood your motives, and never object to correspondents speaking plainly and courteously. We can readily appreciate your view of the case.

H. R. S.—The conditions of relief in any organization which may be formed will be determined by the committee, we presume, who may be appointed; we cannot, of course, lay down conditions. We will, however, shortly make some general suggestions on the subject. If a Benevolent Fund be formed, all kinds of donations and subscriptions will be accepted, and relief granted according to the urgency of the need, the worthiness of the claimant, and the state of the funds. If a Provident Society be established, definite payments and definite relief, under definite conditions, will prevail.

J. B. M.—As a rule, about 4 grains of gallic acid will dissolve in an ounce of distilled water at 60°. If a stronger solution is required, the addition of alcohol is necessary. As a rule, an aqueous saturated solution after filtration is an excellent developer.

JAMES KEANE.—The YEAR-BOOK will be ready shortly. Our Publisher will supply you the NEWS direct. The terms are 4s. 4d. per quarter in advance.

AMATEUR.—Received. Thanks. The communication shall appear shortly.

J. ASHMORE.—The YEAR-BOOK is not yet published, but shall be sent when ready.

SUBSCRIBER.—Thanks: it is scarcely necessary, however, to publish your remarks, however flattering to the committee. On the subject of the disposal of your balance, see another answer to several subscribers who make a similar suggestion. In answer to your general question: most of the statements, or all of them, are as absurdly untrue as those which you have pointed out in your letter. In answer to your definite questions: 1. The treasurer has Mr. Goddard's receipt for all the money charged to him in the balance sheet. 2. We believe that there is no truth in the statement as to a £20 annuity; Mr. Goddard himself told us that he had nothing but the casual contributions to which we referred; the only relatives he had were in very humble circumstances. 3. We know nothing of Mr. Hardy, and do not even remember hearing his name; but, of course, no matter how trustworthy a person he might be, the committee could not honestly delegate to him duties which the subscribers had entrusted to them. The only vote of thanks which the committee could receive has been conveyed in almost every acknowledgment of the balance. Not one of the subscribers has expressed any dissatisfaction with their course.

YOUNG.—We do not usually undertake to express any opinion on the characters of individuals as expressed in their portraits. In case of criticising a portrait of a public man such a course is sometimes natural; but in case of private portraits, such as you enclose, it would be obviously an inconvenient and undesirable course. As photographs, they are pretty good.

SUBSCRIBER.—The letter was addressed and forwarded.

THE GODDARD FUND.—Several subscribers have expressed a wish that their balance could be devoted to a general fund, We would suggest to all so disposed that, as it is not improbable that such a fund will be established, their balance of contributions may be easily retained for a while in anticipation of this possibility.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XII No. 538. — December 21, 1868.

CONTENTS.

	PAGE
Pictorial Effect in Photography.....	613
Photography in Connection with the Abyssinian Expedition. By H. Baden Pritchard.....	614
Extensive Photographic Piracy of Engravings.....	615
Proceedings of Societies—Edinburgh Photographic Society	616

	PAGE
Correspondence—Prints on Approval—Pictures by the Action of Cold—Packing Cases—English Cabinet Work in Egypt....	616
To Correspondents.....	618
Index.....	619—624

PICTORIAL EFFECT IN PHOTOGRAPHY.

THE chief interest in photography amongst the greater number of its devotees must ever centre in its capacity as a pictorial art. During the brief years of its existence the number of its branches has become legion, and its applications increase almost beyond count; but by far the most important of them, in the interest it excites, in the extent to which it is practised, and even in its commercial results, is that which belongs essentially to the region of pictorial art. Photography had its parentage in art, not less than in science, and in its earliest days its chief patrons and admirers were found in art circles. And it was only when its technical disabilities and the limitations of its capacity and appliances were found to interfere with its plasticity for art purposes that it was abandoned by the *dilettante*, and relegated into the hands of the scientific experimentalist, by whom its powers have been educed, its capacity developed, and its range of action altogether modified and extended.

All that belongs to the technics of photography has for some years past been acquiring a high state of perfection: chemical processes, mechanical operations, and optical appliances have acquired a degree of practical perfection which has tended materially to remove the disabilities for art purposes which at one time seemed inherent in photography. For some time past the one thing needful to extend the domain of photography in the region of pictorial art, and to furnish indisputable credentials to its adherents to be recognized as legitimate subjects in that region, has been a higher culture and a more perfect knowledge of pictorial conditions. Aids to art study of a general kind have not been lacking, but they have, for the purpose in question, seriously wanted special photographic application. Desultory art instruction of a more special kind has been found in photographic journals; but this has lacked the systematic and progressive character necessary to give completeness to such instructions. We have, however, in the course of the present volume, endeavoured to supply the existing and deeply-felt want, and in the lessons on pictorial effect in its photographic application, we have, we believe, furnished the photographic art student, not only with more comprehensive and detailed instructions than have ever before been published, but with sufficient guidance, if carefully studied and honestly followed, to enable him to attain high excellence in the practice of pictorial photography.

One word in especial relation to the articles themselves. When, at the commencement of the present volume, we announced that a series of articles on pictorial effect in relation to photography should appear in our pages, we stated that contributions towards such a series had been sent in and promised from various sources, and that this

material would be placed in the hands of Mr. Robinson for arrangement, addition, or elision. This was the original programme. Mr. Robinson found, however, at the outset, that the plan proposed would materially limit the systematic and progressive character and consequent completeness and usefulness of the articles. He therefore preferred to commence unfettered by other material, producing just such a series of articles as his own art study and photographic art practice suggested would be most valuable to the earnest student of pictorial photography. As Mr. Robinson had not only long occupied a foremost position in the ranks of art photography, but had, previous to his introduction to photography, spent some years in the study and practice of art as a painter (his work in this direction having been exhibited at the Royal Academy and other exhibitions of paintings), we felt that his desire in this respect should be held paramount; and our readers have gained the advantage in the fulness, completeness, and admirable simplicity and perspicuity of the series of art lessons just completed.

But few words need be added on the subject of art study itself. It is perfectly true, that the greatest and grandest elements in pictorial art cannot be taught. No art teaching will confer the power to conceive a fine picture; but given the creative instinct, art culture can aid the student in giving to his conceptions pictorial form, and save him from much heart-breaking disappointment at the crudities which result from attempts to give pictorial expression to thought, without a knowledge of the conditions of pictorial effect. Art culture will often, too, stimulate conception, and a knowledge of conditions will often suggest the thoughts which may be expressed by their aid.

Further, a knowledge of the laws of pictorial effect is of emphatic importance to the photographer, because he is less called upon in his art to attempt to give a form to pictorial conceptions than to give pictorial embodiment to existing facts; and it is often only by arrangement of materials and management of light and shade that a pictorial character can be given to the representation of prosaic facts. To the painter who can give interest to his picture by the beauty of the subject, or of the thought represented, and to whose work the glamour of colour can add fresh charms, some disregard of the laws of composition may sometimes be permitted without pictorial loss. To the photographer who would excel as an artist, a rigid attention to all that can be reduced to rule becomes imperative, because it often forms his sole means of elevating his work beyond the rank of a mere diagram or plan and elevation of some very commonplace and unpictorial piece of nature's handiwork, whether animate or inanimate.

We urge the photographic art student, then, whilst in no degree neglecting the culture of the esthetics of art, to





614
ground himself first of all in its simple framework by a study of rules, and assiduous practice, for practice' sake, of those rules. We have before quoted, and we now repeat, an admirable remark by Dr. Thompson, bearing on the question: "Every art, from reasoning to riding and rowing, is learned by assiduous practice; and if principles do any good, it is proportioned to the readiness with which they can be converted into rules, and the patient constancy with which they are applied in all our attempts at excellence." In the series of lessons just completed, recognized rules have been clearly stated, and principles have been, as far as possible, stated with the simplicity and precision of rules, and their application clearly pointed out and illustrated. It remains for the student to put them into practice.

PHOTOGRAPHY IN CONNECTION WITH THE ABYSSINIAN EXPEDITION.

BY H. BADEN PRITCHARD,

OF THE GENERAL PHOTOGRAPHIC ESTABLISHMENT OF THE WAR DEPARTMENT.*

THE greater part of the varnish (chloroform and amber) was found unsuitable for use in a hot climate, out of doors, as the film did not harden rapidly, and was frequently rendered tacky by the heat; this was the more annoying from the circumstance that whenever a negative was taken, copies of the same were required to be printed off immediately. For work of this description, Sergeant Harrold prefers to use Newman's Diamond Negative Varnish.

With but few exceptions, the chemicals and appliances were in first-rate order, and worked almost without a hitch. In copying plans—an operation which was, of course, conducted in the open air—much difficulty was experienced from the breezes which blew almost incessantly in the vicinity of the mountains. Often the maps were blown right off the copying-table; and during exposure it was frequently necessary to keep brushing the dust and sand from the original, a proceeding which sometimes militated against the sharpness of the reproductions.

Work had to be undertaken at all times, so that at any moment the photographers were ordered to fall out on the line of march, whatever might be the state of the weather, and the likelihood or possibility of success. When the duty had been performed, successfully or unsuccessfully, as the case might be, the boxes were packed, the mules saddled, and the head-quarters caught up again as soon as possible. Paper was sensitized over night whenever a halt was made, about sixty sheets being prepared at a time, occupying the staff between four and five hours. Early in the morning the prepared paper was rolled in sheets of blotting-paper, and stowed away as far from the light as possible; and on arriving at the next encampment printing was at once commenced. After toning and fixing, the prints were washed for two or three hours, and if water happened to be plentiful, which was very seldom the case, the same was changed several times during the night. When the pictures were urgently required, they received but an imperfect and hasty washing; but otherwise they were packed moist in blotting-paper, and again washed on the first opportunity; when the prints dried in contact with the paper, the latter required to be carefully moistened before a separation was attempted, as pictures in this condition are very liable to injury. The squaring and mounting operations were performed without difficulty.

It will be a question in future operations of this kind whether, instead of printing the plans on paper and mounting them afterwards on linen, it would not be better for field purposes if they were produced direct from the fabric. The material might be kept ready stiffened and albuminized; the sensitizing and printing operations would not be more laborious or time-taking, and the amount of washing required would be very small, as the

water readily permeates the fabric. The time gained by shortening the process of washing, and obviating altogether that of mounting, would be considerable.

A subject of regret is the fact that a great deal of useless work was sometimes performed on account of the ignorance of photographic matters on the part of staff officers who gave orders. This occurred the more frequently from the fact that Colonel Pritchard's command was so extensive that he was unable to give the photographers his undivided attention. Such a state of things would easily be avoided in future by sending an officer well skilled in photography in immediate charge of the party; it would then be possible to question the feasibility of an order upon its receipt, instead of vainly endeavouring to obey an impossible mandate, and wasting valuable time and materials unnecessarily. In many cases, in taking landscape pictures, a rough, imperfect sketch was frequently all that was required; but even this, under unfavourable circumstances, is sometimes quite as difficult to secure as a perfect picture. With soldiers there is, however, no appeal; and an order given must be obeyed if possible. So sometimes the mules had to be halted and the boxes unpacked during a long march in a drizzling rain, in order that a picture might be attempted of some mountain or other, the top of which was enveloped in a dense fog, simply because a staff officer had expressed himself to the effect that the whole would make a grand picture.

The scarcity of water on the line of route was a serious evil; several negatives had frequently to be washed in the same water, and the prints fared no better. Besides, the water was in general badly adapted to photographic purposes, being very hard and full of chlorides, involving, therefore, great waste of silver in its employment; a distilling apparatus had been provided for purifying the water, but the latter was always so scarce, and time so pressing, that the still was rarely resorted to. From the fact that the majority of negatives taken were those of maps requiring a lengthened and more varied treatment than ordinary plates, in order to produce a film of considerable density, the want of an abundant supply of water was felt more seriously than would have been the case in ordinary manipulations.

On inspecting the landscape and other negatives taken by the chief photographer and his assistants, it will be seen that they include many creditable productions; and when we remember that not a single one of them was specially selected for the camera by the photographers themselves, and that the series of sixty negatives has not been weeded out, but represent the whole number produced to order, sometimes with the sun shining directly into the camera, sometimes when the sun had gone down, sometimes with the camera in the sunlight and the object to be reproduced in a covered tent, at most unseasonable times, at all hours, after long marches, and by men who had besides to perform the duties of soldiers—I say, when we bear in mind the circumstances under which the operators laboured, the work they have performed is highly commendable. There is, however, one more picture which should have been included in the set our friends have brought home, and which is eagerly sought for by every examiner of the sketches; its absence is regretted, however, by nobody so much as by Colonel Pritchard himself, who was indefatigable in his endeavours to obtain interesting subjects for the camera, but who was unfortunately wounded at the storming of Magdala, and, therefore, unable to perform any active duties for some days after the death of King Theodore. An order was sent down by General Napier to obtain a picture of the fallen chief, but, owing to some delay, the instructions were not given to the Engineers until after the interment; the authority for visiting the body reached Sergeant Harrold one hour too late, and thus has been lost all record of those features, a delineation of which by photography, even of the crudest description, would have been of great

How eagerly should we all have scanned the portrait, in England, in endeavouring to read from the markings of the brow the character of the detestable warrior we had vanquished!

But, we must be contented with the pictures we had there are some among them possessing deep interest.

There is the conference tent at Durbagh, where the meeting took place between Napier and Kassai: it was alleged, but treachery was feared, and, accordingly, we see upon the field the troops and guns prepared for salute or for action; for it was deemed almost improbable that within half an hour of the firing that picture the landscape might be turned into a field, and the labours of the photographers rendered more serious purposes. There are the views of the late King Theodore's house; of Selassie, the height on the Good Friday, together with the rock from which the Emperor's big gun first opened fire; groups of some of the captives, who are now probably scattered all over Europe, and whom, even within twenty-four hours of liberation, it required some energy on the part of the photographers to collect together to be photographed. Of the lakes of Abyssinia, there are views of those of Lake Tana, Magdala, Focada, and Antalo; pictures of the lake and of scenery on the banks of the Tella, the Djedda, and Bashelo rivers, besides representing all the principal points of interest and architectural features met with.

In the whole, therefore, I think we can congratulate the English Engineer photographers, and more especially the late Harrold, on the manner in which they performed their duties; to them the staff of the army was indebted for information obtained and circulated by the camera, their labours forming no unimportant part of the cog-wheel of administrative machinery, which, under the guidance of Sir R. Napier, worked so smoothly; to them we at home are indebted for a clear view of the nature of the country, for presenting to us the various difficulties met with during the pilgrimage to release the prisoners, for giving us a true picture of King Theodore's stronghold, and for showing what the inside of Magdala was like. And I feel a will agree with me in the opinion that if ever a medal has been well earned by a photographer, it is which Sergeant Harrold now wears upon his breast, which was specially awarded to him for distinguished services rendered in the field before Magdala.

EXTENSIVE PHOTOGRAPHIC PIRACY OF ENGRAVINGS.

of extensive piracy was last Friday brought before Mr. Alderman Allen and Alderman Sir Robert Carden, when Coleman, John Lawrence, and William Hooper were charged with conspiring together to sell and publish pirated copies of certain engravings of great value, contrary to law. Mr. Lewis said he appeared to prosecute the three prisoners, if of Mr. Henry Graves, for a conspiracy to injure his business, by publishing and selling pirated copies of certain engravings, for the copyright of which he had to pay a large sum. The prisoner Lawrence, who appeared to be a realist, had supplied the copies to Coleman, who hawked about the streets of London after they had been mounted upon paper. The Act under which the charge was brought prohibited protected paintings, drawings, and photographs from being made into an offence punishable with a very severe penalty to sell or publish a copy without the consent or authority of the owner. Mr. Graves had spent enormous sums in securing his copyright works. He sold copies of them for three or four guineas each, whereas those exhibited in the streets by the defendants might be had for £1 or 30s. Henry Graves gave evidence as to his copyright in the pictures, including the "Railway Station," &c., and as the piracies produced having been manifestly copied from

Mr. Alderman Allen, looking at a print, said: This photograph is not so perfect as the others.

Witness.—No, they all fade in a very short time. They should be all stopped in publication. I produce a certificate of the registration in February, 1865, of O'Neil's picture of "The Anxious Mother," with an impression from my plate.

Mr. Lewis.—Is the photograph produced a piracy?

Witness.—Certainly; and I may state that if this thing goes on they will have nothing to copy from, as publishers will not produce an engraving to have it copied the very next morning. I also hand in a registration certificate of Miss Edwards' painting, "The Last Kiss," and I produce a photograph which has been taken from my engraving. Every touch and every line of the original engraving is reproduced in that photograph.

Mr. Lewis.—I believe the original plate was destroyed in your great fire?

Witness.—Yes; in fifteen minutes I lost £40,000 worth of property. I produce a certificate of the registration of Millais' picture, "The Parable of the Lost Piece of Money," which was unfortunately destroyed in the fire at Baron Marochetti's studio. There are thousands of piracies now in circulation, and the effect is almost to annihilate my sale. I sell "The Railway Station" at five guineas a copy; the defendants at 21s. They probably get 19s. profit on each picture; in fact, it is to them all profit. Last week a package of them was stopped at the Custom House, and the importer was fined £60 or £70 at the Thames Police Court. I believe they are mostly manufactured at Birmingham. I have spent £500 or £600 on these prosecutions, after deducting the fines. I hope the time will soon come when engravings will be protected like banknotes, and the forgery of them punished with equal severity.

At the request of the prisoner Coleman, the charge against him was read by Mr. Oke, the chief clerk. He said, in answer to it, that it was totally untrue; that it was impossible for the photographs to have been produced at Birmingham, where the atmosphere was so dense; and that he obtained them from a man who told him that they grew in a nursery garden near St. Paul's Cathedral. (Laughter.)

William Henry Burgess was next examined by Mr. Lewis. He said: I am in the employment of Messrs. Graves and Co., publishers, Pall Mall, and I have known the prisoner Coleman as a hawk of photographs for about six weeks. (This was denied by the prisoner.) I have been watching him for that time, and have seen him almost daily selling pirated copies. He carried them in a box and exposed them for sale in the street. I saw him on the 24th and 25th, and sent for Mr. Graves, Jun.

The Prisoner.—You are a nice fellow. (Laughter.) You came to my house, learnt all about my business, and ended in taking my daughter to the theatre. You promised to send me yesterday two nice orders, and you kept your word by sending me the warrant. You can't call yourself a man.

Witness.—On the 25th of November I bought from Coleman, at his house in Banner Square, St. Luke's, the 41 cartes-de-visite produced for 3d. each.

The Prisoner.—You offered me £100 if I would tell you where I got them from; and you wanted to become my partner.

Mr. Lewis said Mr. Graves had not cared what money he spent in finding out the source of these piracies, and it was quite true the witness had suggested a partnership.

Witness.—On the 3rd of December I bought seven more cartes, and on the 14th four—all at 3d. each. I have watched the prisoner Lawrence for about six weeks. He occupies a room on the third floor of a house in Powell Street, Goswell Road. Coleman has been in the habit of going there night and morning and leaving his photograph box. He used to open the door with a latch-key.

The prisoner Lawrence.—It is an abominable falsehood.

Witness.—I have spoken to Coleman about his business, and I told him if he would give me the name and address of the person from whom he obtained the photographs I would find £50 to go into partnership with him. He said he would do his best, but the "old man" was a "screw," and very close-fisted. He added, "We have no right to sell them, as we are liable to a £5 penalty on each." On one occasion, while we were talking, a gentleman came up and asked Coleman for a copyright picture. He supplied him with one, afterwards saying to me, "He looks like one of Graves's men and a touter; what do you think of it?" I replied, "I don't know; he looks queer." (Laughter.) He then asked me my profession, and I told him

I was an architect—Coleman told me if he ever got a summons he should "make a bolt of it."

The prisoner Coleman.—I said I should go away in a balloon. (Laughter.) His evidence is a tissue of falsehoods. I have sold pictures, not knowing there was any harm in it.

Witness continued.—I was present when Lawrence's house was searched. There were 850 printed copies of Mr. Graves's pictures found, as well as hundreds of those of other publishers.

By Mr. Wontner.—Hooper keeps a shop in Jewin Street, and I believe he is a respectable man.

Edward John McDouall said he was in the employment of Mr. Graves, and had been engaged for the last month in watching the three prisoners. He went to Hooper's shop on the 3rd of December, and took a copy of Mr. Graves's "Monarch of the Glen" to be mounted. Hooper was not present. His wife opened a large paper parcel, and showed him copies of "The Railway Station," "The Second Sermon," and "A Piper and a Pair of Nutcrackers," among many others. They were all mounted, and witness afterwards saw Lawrence leave the house with a parcel like that shown him by Mrs. Hooper. A few days after he went back to fetch the engraving, and saw Hooper. He showed witness some copies of engravings, but declined to sell them, as they were copyrights, and as he had been engaged to mount them for a gentleman.

The prisoners Coleman and Lawrence both seemed anxious to exonerate Hooper, but were stopped in their statements with that view by Mr. Wontner, who defended Hooper.

Mr. Boydell Graves said: I am manager to my father, and saw Coleman selling pirated copies of his photographs in Lime Street Square on the 23rd of November. I purchased two copies of "The Last Kiss," one of "The Railway Station," and two of "A Piper and a Pair of Nutcrackers" on that day. He represented that only two copies out of every hundred manufactured were sent to London. I counted the pirated photographs found at Lawrence's house at Bow Lane Police Station yesterday, and found there were 700 cartes-de-visite and 150 of a larger size. They were all taken from Lawrence's bedroom.

The prisoner Coleman: If you saw me selling these things, you should have said, "My good man, you know you're doing wrong; just hook it." (Laughter.)

John Mark Bull, a city detective sergeant, said he received the warrant for the apprehension of the prisoners, and went on Thursday to the house of Lawrence, in Powell Street, St. Luke's, with the witness McDouall. He saw Coleman come out with a large black photograph case, and stopped him in Old Street.

Edward Funnell, another city detective sergeant, said he had acted with the last witness in the matter, and on Thursday sent a messenger to Lawrence's house in Powell Street. The prisoner opened the door, and witness told him the charge on which he would be taken into custody. He became very excited, and said no three men alive should take him. He was, however, arrested, and he then admitted that he knew Hooper, whom he had employed to mount photographs. Witness found 850 pirated copies of Mr. Graves's subjects at his house, with several hundred others. The prisoner told him they came from Scotland, but he could not tell where. Witness afterwards arrested Hooper, who acknowledged that he had mounted photographs for Lawrence, and produced his books, showing the work done. Two copies were found at his house, and he said he had supplied Lawrence with 28 that morning.

The prisoner Lawrence said he had been all over Scotland and England, and had bought them at different places.

At this stage, Mr. Lewis applied that the prisoners should be remanded.

Mr. Wontner submitted that there was no case against Hooper, who, it had been proved, absolutely refused to sell a single copy of the pirated photographs.

Mr. Lewis said it was part of the conspiracy to help to produce the photographs, and this Hooper had done.

Mr. Alderman Allen remanded the prisoners until Thursday next, and offered to admit them to bail in the meantime—themselves in £100 each, and two sureties in £100.

The prisoner Hooper at once left the court, having found the requisite amount of bail.

The other prisoners were conveyed to Newgate, Coleman, as he was leaving the dock, causing some laughter by offering to become surety for "his friend" Lawrence.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Photographic Society, being the fourth of the session, was held on the evening of Wednesday, December 16; Mr. NICOL occupied the chair.

The minutes of a previous meeting having been read and confirmed, the following new members were duly elected:—Mrs. John Peat, East Claremont Street, Edinburgh; Miss Wood, 130, George Street, Edinburgh; Mr. Finlay Anderson, 32, Moray Place, Edinburgh; Mr. E. J. Dallas, Princes Street, Edinburgh; and Mr. J. Macdonald, Lasswade.

The CHAIRMAN expressed his gratification to observe that ladies were beginning to join the Society, and would urge upon those present the desirability of inducing as many of their friends as possible to enter their ranks. He should like, in fact, to see the Society composed of as many ladies as gentlemen, and saw no reason why it should not be so.

Mr. NORMAN MACBETH then read a paper on the importance of a few of the leading principles of the art of drawing, and their bearing on photography, and exhibited drawings in illustration of the paper. This will appear in our pages in due course.

The CHAIRMAN thought it would be unnecessary for him, as well as impossible, to comment upon the paper, beyond remarking that it was, he thought, the most valuable paper they had ever had before them. It seemed to him to combine the practical with the theoretical in such a way as to make it useful to every photographer, both amateur and professional. Every one of them would, he doubted not, derive a great deal of advantage from it. At that late hour it would not be desirable to enter into anything like an extended discussion, the more so that it seemed to him that the whole of the propositions had been so self-evident, and the whole of the information so unobtainable, that the only thing they could do was to take what they had got, be exceedingly thankful for it, and make the best use of it they could. He would be glad, however, to hear the remarks of any gentlemen present, if they would promise to be judiciously brief in their observations.

Mr. GEORGE CAMPBELL suggested that it would be well if they could devote an entire evening to the discussion of the subject of such paper, if they had courage to take it up and do it justice.

Mr. DAVIES (Secretary) remarked that, in that case, it would be better to wait till the paper was printed.

The CHAIRMAN heartily approved of the idea. If they had the paper printed and in their hands, it would be of very great benefit carefully to study it; and seeing that Mr. Macbeth had kindly volunteered to give any assistance to any one wishing a little more information, he had no doubt that gentleman would be present at the discussion and help them by information or explanation. The Business Committee would doubtless appoint an evening for the purpose of resuming the subject, after the paper had been published and in the hands of the members.

Mr. ROSS, in cordial terms, proposed a double vote of thanks to Mr. Macbeth, and remarked that he was only afraid the discussion would be tame, flat, and unprofitable, because there was very little in the paper that any one could contradict or gainsay.

Mr. SANDFORD, of London, then exhibited and explained an arrangement for using the magnesium light for enlarging purposes. The only apparatus at his disposal was, unfortunately, defective, and did not give a proper idea of the system. It was therefore agreed that at the next meeting two of the members who are in the habit of using Mr. Sandford's apparatus should give a practical demonstration of its capacity.

The proceedings then terminated.

Correspondence.

PRINTS ON APPROVAL.

DEAR SIR,—The question of "prints on approval" has, perhaps, an aspect overlooked by Mr. Cherrill. If pictures are to be so sent, what wonder if photographers bent on "business," when they have a difficult subject and take

several plates before a passable portrait is obtained, send prints from each plate taken, in hope that one, at least, may please, instead of washing off the bad ones on their own responsibility, and so get the "art" the bad name of making people look cross?

This is the custom with some, I fancy, as I have several times had this remark made me: "I suppose you will send me prints of both." Surely the better plan is to turn out only those with which the photographer is, at least to some extent, satisfied? But, ignoring this aspect of the matter, his paper seems to rest on this rather uncertain foundation: "The public is not so fond of having its portrait taken that it will reject pictures unless they are absolutely too bad. There are, indeed, many people who would sooner put up with a bad portrait than have the trouble of sitting again." "Many," there are, no doubt; but how about the rest? "May I come again to-morrow?" has been the request of merry little sitters who have occupied the best part of a bright morning; and children grown older in the use of the looking-glass have expressed an idea not altogether different. Must a photographer make his studio a chamber of horrors to avoid the impositions of those who, "now they see it, do not quite like the effect of the dress;" or, who "wish, after all, that they had sat down instead of standing?" &c.

To meet the difficulty, we put the following on our receipt form:—"To avoid disappointment, it is recommended that sitters should have one copy of their portraits before more are printed. If, for any reason, the first should not be satisfactory, another sitting will be given for half-price, provided the copy of the first be returned, when the negative will be destroyed."

Very few indeed object to that solution of the difficulty; even those who have been treated on the other plan, elsewhere, agree that ours is reasonable and fair.

Allow me to make two extracts for the benefit of those who prefer to follow Mr. Cherrill, that they may know how far they may have to go:—"To take a successful photographic portrait is a much more wonderful thing than many people seem to think. Persons who have known each other, and who have been constantly in each other's society for a long course of years, naturally know infinitely more of each other than those who meet only for a few minutes once, perhaps, in the course of a lifetime; and yet the photographer is often blamed if, after five minutes' conversation with a person whom he has never before seen, he cannot call up in the portrait he produces the very best expression ever seen by even the most intimate friend of the sitter." And: "It matters not how artistic the pose may be, it matters little how good the picture may be, it matters absolutely nothing how good the photograph may be, if the portrait is not approved of, its condemnation is complete; and if a picture is condemned, who is to blame, the sitter or the artist? Certainly, in nine hundred and ninety-nine cases out of a thousand, not the sitter."

Or, if I may put it in other words, "It is wonderfully difficult to take a successful photographic portrait, especially as you may not have an opportunity of seeing the expression you ought to get; but if you do not get it perfectly, it is entirely your own fault, and the "public has a right" to claim that you shall go on till you do; and you must consider your trouble paid for in your reputation." Let me ask Mr. Cherrill how often he is quite satisfied with his own work?

Some one (perhaps as good an artist in his way as some photographers) once said, that his genius was declining, because he was satisfied with his productions.—Yours, truly,
ED. SEELEY.

PICTURES BY THE ACTION OF COLD.

SIR,—I cannot help thinking that, with some few modifications, Mr. Winstanley will succeed in his experiments in "cold printing." It seems to me that the causes of failure

were two; viz., a too great quantity of iodine in the vapour used, and much too short a time in the application of the cold. I reason thus:—In the original phenomenon of the radiant heat from the colours in the pattern of the carpet, I presume that no deposit of the vapour of the room would have taken place, except on a considerable lowering of the temperature, and that, by such low temperature being long continued—that is, for the entire night—an image was gradually built up on the portions of glass which received the less radiant rays. Again, the Wisconsin climate, with its 70° below our freezing point, would only have to act through one layer of glass, and that, as I said, for many hours continuously; whereas, the cold of the ether was induced only for "several minutes," and then, ere it could come in contact with the vapour so as to condense it, it had to penetrate through two thicknesses of glass, a thickness of paper, two thin layers of atmospheric air, and a thickness of collodion film. Now Melloni, as the result of his experiments on the diathermic properties of bodies, places glass as more unfavorable to the transmission of heat rays than even ice itself—that is, under certain circumstances. Air is a bad conductor, and the paper would represent a sort of cotton blanket. As this winter may afford an opportunity for a thorough and inexpensive repetition of the experiment, I should suggest it being conducted thus:—First of all, to ascertain the weakest iodized vapour which would remain for some hours in contact with collodion film at ordinary temperature without so condensing as to charge the film with iodine, and render it capable of forming a *general* layer of iodide of silver in the bath, and so, if presenting an entire sensitive surface to the light, which must blacken all over on the application of the developer. Having determined this, I should put my collodionized plate face down over the vessel containing the vapour; I should then take a rather deep dish quite flat at the bottom, and pasting the printed paper on to the reverse of the glass carrying the collodion, I should place the bottom of the dish firmly upon the paper while it was still slightly damp, then fill the deep dish with snow or pounded ice, which I should sprinkle with hypochloride of ammonia and common salt, and then leave it all night. I should expect, with this long-continued low temperature, that opposite the dark letters of the paper there would be a copious deposit of vapour charged with iodine, with, perhaps, a small amount from the cooling down of the layer of air in contact with the collodion surface; but I think that the after operations would show the difference between the radiant and non-radiant portions, and so produce the analogue of the original phenomenon.

I trust that Mr. Winstanley will see that I am not attempting to dogmatize, but only offering suggestions; and that if that gentleman should succeed in a future trial, to him will belong all the credit of a philosophical and beautiful experiment.—Yours, &c.,

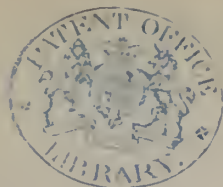
JOHN ANTHONY, M.D.

Washwood Heath, nr. Birmingham, December 19th, 1868.

PACKING CASES.

SIR,—At this season, like many others, no doubt, I find a good many uses for the cases accumulated in the course of the summer's business. I have no doubt, too, that others have experienced the evil of which I complain. I find that the enormous nails used by the first senders to secure the cases so split the wood as to make the second securing of them, if not an impossibility, at least a matter of great trouble. Would it not be better to supply the cases with screws? I fancy it would be to the interest of the wholesale houses themselves, besides being, I am sure, a favour to the customer on whose hands the dilapidated remains are eventually cast.—I am, sir, yours &c.,
Y.

Preston, December 15th, 1868.



THE INDEX TO VOLUME XII.

A

ABRIDGMENT of specifications relating to photography, 219
 Abyssinian expedition, by H. Baden Pritchard, photography in connection with the, 604, 614
 ———, photography and, 191, 206, 239, 251, 350, 455
 ——— prince, photographs of the, 455
 ——— scenery, 575
 Academy of 1868, by Nelson K. Cherrill, 376
 Accident in boiling down a bath, 443
 Acetate bath, decomposition in the, 419
 ——— of lead in the printing bath, 126
 Actinic value of colour in negatives, by M. Carey Lea, 389
 Actinism, the transmission of, by glass, 310
 ——— *versus* illumination, 262
 Actinometer, Mr. Bing's new, 422
 Actinometry, by L. Bing, 416
 Adhesive mediums, a word or two in favour of paste, by a Practical Man, 174
 Africa, photographic difficulties of an amateur in South, by Dr. Mann, 134, 140, 152
 Albumen, 345
 ———, from a chemical point of view, by J. Spiller, 170
 ——— opalotypes, 69
 ——— prints, by M. Carey Lea, reaction of hyposulphites and sulphocyanides upon, 453
 Albuminized paper and printers, 549, 561
 ——— and brilliant prints, 563
 ——— and printing, by N. K. Cherrill, 536, 542
 ———, blistering of, 53
 ——— ready for use, sensitive, 337
 ———, salting formulae of, 525
 ———, the proportion of salt employed in, 507, 514, 538, 573
 ———, uneven drying of sensitized, 509
 ——— prints, varnishing, 311
 Alcohol in developing and fixing solutions, 51
 ———, rectifying, by means of gelatine, 432
 Amateur Photographic Association, 202, 560, 587, 597
 ——— criticism, 566, 573
 America, international copyright with, 143, 179
 ———, photographic convention in, 180, 212, 228, 274
 ———, prices of photographs in, 8
 ———, studio and processes in, 495
 American examination of Mr. McLachlan's discovery, an, 603
 ——— Institute, proceedings of, 274
 ——— patent office, photography at, 107
 Amorphous albuminized paper, 586
 Antidote to vegetable poisons, 407
 Application of photography, another, 11
 ——— of the camera-obscura to harbour defence, 510
 Approval, prints on, 616
 Aqueous varnish, by C. Meinert, 288
 Archaeology, photography as an aid to, by J. Henderson, 163, 178
 Art critic on the late exhibition, 589
 ———, lectures on, 10, 56
 ——— studies, photographic, 515
 ——— teaching and art study, by Respice Finem, 487

Artificial light, by David Wiostanley, on the economical use of, 245
 Artistic copyright, 587
 ——— pictures photographically considered, by E. Dunmore, 19
 ——— printing, Mr. Piercy's patent method of, 318
 ——— process, patent, 311
 Atmospheric effects in landscape photography, by Nelson K. Cherrill, on natural clouds and, 87, 208
 Austria, photographic enterprise in, 122

B

BACKGROUNDS and accessories, by James Martin, 531
 ———, landscape, to portraits, 346
 ———, some hints on, 278
 Ball, William, photographs to historical and architectural notes, 399
 Balloon photography, 240, 479
 Bankrupt pirate, a, 275
 Bath, accident in boiling down a, 443
 ———, making a, 527
 Baths, some experiences with, 155
 ———, old, 179
 Battery, chloride of silver, 83
 Beattie, John, lighting the sitter, 511
 ———, posing phenologically and psychologically considered, 567
 Belgian volunteers, photographs of, 107
 Bellows camera, making a, 11
 Bell, William, mixture for retouching negatives, 333
 Bensa, L. G., the photographers' reference table, 327
 Best photographers, 383
 Beverley, J., dry-plate photography, 247
 Bichromate of potash, poisoning by, 299
 Bing, L., on actinometry, 416
 ———, new actinometer, 422
 Biographical photographic albums, 287
 Black tones, 491
 ——— varnish, 359
 Blake, J. M., means of equalizing exposure with wide-angle lenses, 594, 607
 ———, means of equalizing exposure with the wide-angle lens, 607
 Blair's carbon experiments, 443
 Blanchard, Valentine, some remarks upon stereoscopes, 499
 Blistering of albuminized paper, 53
 Blisters in albuminized paper, 143
 Bloede, Victor G., on a new method of recovering metallic gold and silver residues, 272, 331
 ———, removing varnish from a collodion film without injury, 128
 Blue glass in photographic studios, by M. Alois Nigg, on the employment of, 439
 Blurring, with a new remedy, by M. Carey Lea, 234
 Bockett, John, on some of the changes which take place in photographic materials and chemicals after lengthened disuse, 233
 Bolton, W. B., on collodio-bromide, 149
 Bordeaux, M. Omer, on the employment of mixed collodion, 546

Bovey, W. T., photographic printing in silver, theoretical and practical, 86, 122, 160, 157, 221, 256, 291, 304, 399, 511, 524
 ———, fireside musings, 7
 ———, mode of toning, 346, 574
 Braun's collodion, 126
 ——— reproductions, 395
 Brewster, Sir D., the last words of, on photography, 139
 ———, the late, 74
 Brigandage, photography and, 11
 Brine, a remarkable natural, 83
 British Association for the Advancement of Science, 409
 ———, members of, 599
 Bromides in a collodion containing a potassium salt, 265
 ———, test for, 218
 Bromide patent, the, 347, 383, 398, 457
 Bromine upon certain ethers, on the action of, by MM. A. Lulenberg and H. Wichelhaus, 343
 Bromo-iodized India-rubber, 359
 Browne, J. C., redevelopment by nitrate of silver and citric acid, 234
 ———, view of New York, 5
 Bruges and its belfry, 459
 Burgess, studio at Norwich, 410, 422
 Burke's photograph, Col., 180

C

CABINET background, 22
 ——— portraits, 203
 ——— in America, 311
 ——— with natural backgrounds, 432
 ——— work in Egypt, 618
 Camera-obscura to harbour defence, application of the, 510
 ——— printing and collodion prints, 217
 Campbell, W., an easy mode of obtaining the position and focus for field views, 314
 Canvas for enlargements or direct printing, by J. M. Loewe, preparing, 212
 Carbolio acid, 467, 479
 ——— in the silver bath, 448, 515
 Carbon and other tissues, a modification in transferring, 229
 Carbon printing, 22
 ———, by M. Carey Lea, 176
 ———, simplified, 589
 ———, progress of, 497
 ———, simplified manipulation in, 277
 ——— process, by Dr. H. Vogel, remarks upon the, 200, 308
 ———, by M. Jeanrenaud, observations on the, 463
 ——— not Braun's, 110, 242
 ———, notes on the, 297
 ——— reproduction, 156, 483
 ——— tissue, modified, 99
 Carbonate of ammonia in the fixing bath, 47, 53
 ——— of lime in toning, 323
 Carriage of photographic goods abroad, 331
 Carrier's sensitive paper, 319
 ——— albuminized paper, 599
 Cases, packing, 617
 ——— uses of spots in prints, 11

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Luggage, what is passengers', 467
 Lux Graphics on the wing, 154, 202, 263, 413, 456, 560, 610
 — in defence, 588
 —, the use of clouds as backgrounds in portraiture, 99
 —, the use of clouds in landscapes, 27

M

McLACHLAN, Mr., remarks upon the wet collodion process, 245, 259
 McLachlan's discovery, Mr., 45, 58, 85, 181, 193, 202, 214, 229, 241, 253
 —, an American examination of, 603
 —, by Nelson K. Cherrill, 197
 — nitrate of silver, by J. Spiller, F.C.S., 254
 — process, by John Spiller, F.C.S., observations on, 195
 Magic lantern and photography, by J. Martin, 9, 28, 69, 79, 100, 133, 161
 —, development exhibited by, 107
 —, gas or oil lamps for the, 154
 Magnesia toning baths, 275
 Magnesium, cheap, 611
 — light, enlarging by the, 37
 Magnified photographic pictures, 309
 Mann, Dr., photographic difficulties of an amateur in South Africa, 140, 152
 —, Professor Smyth's "Great Pyramid" bath, 296
 Manufacture of glass, Mr. Chance's lecture on the, 236
 Marking ink, by H. Neale, 592
 Marseilles, Photographic Society of, 284, 394
 Martin, J., backgrounds and accessories, 531
 —, the diamond, 281, 367
 Masking prints, a new method of, 513
 Mason, O. G., removing varnish and collodion film from old negatives, 437
 Measurement of the luminous intensity of light, by William Crookes, F.R.S., &c., on the, 308, 391
 Mechanical printing process, by R. Griggs, photography applied to, 199
 Medals at the Cornwall Polytechnic Exhibition, 482
 —, final, of the French Exhibition, 371
 Memorial card mounts, 323
 Mercury, the stability of negatives intensified by iodide of, 431
 Methylic alcohol, artificial, 345
 — into ethylic alcohol, conversion of, 345
 Micro-photography, by Jules Gerard, 572
 —, stereoscopic, 10
 Microscopic Society, soiree at, 215
 Middleton, J. B., combination negatives, 282
 Military school of photography at Chatham, the, 373
 Mirage at Dover, remarkable, 251
 Moist condition, by General Mongin, on the preservation of collodionized plates in a, 253
 Monckhoven's, Dr., photographic optics, 146
 Mongin, General, on the preservation of collodionized plates in a moist condition, 253
 Monochromatic light as a means of detecting disease, use of, 228
 Moon, photographs of the, 264, 273, 309
 Monstre photographic group, a, 347
 Morphine plates, insensitised spots on, 215
 — the moist process, 2
 Morien, Prof., on a peculiar action of light upon the salts of silver, 419
 Motive power, new, 345
 Moulds for the galvanoplastic process, 335
 Mounting-boards, sulphur compounds in, 189
 — cards, on the occurrence of hyposulphites in, by J. Spiller, F.C.S., 220
 — photographs and engravings, method of, 389
 Mounts for cards and cabinet pictures, 96
 Mount for photographs, new style of, 602

N

NATURAL accessories, 432
 — backgrounds, portraits with, 83, 203, 432
 — in landscape photography, by J. R. Johnson, 28
 — colours in photography, approximate in, 299
 — negatives, 587
 — clouds and atmospheric effects in landscape photography, by Nelson K. Cherrill, 87, 209
 Neale, H., photographic marking ink, 592
 Negative bath, by J. R. Johnson, a new method of treating, 93
 — belong, to whom does a portrait, 493
 — injury to, by varnishing, 262
 Negatives, the effect of manipulations on the character of, 529
 — transferred to leather collodion, 470

Neutral nitrate bath, 297, 299
 Newman's diamond varnish, 359
 Nigg, M. Alois, on the employment of blue glass in studios, 438
 —, a visit to the photographic studio of the Imperial Military and Geographical Institute in Vienna, 592, 635
 Nitrate bath, keeping in order, 121
 — of nickel in photography, 287
 — of silver, another substitute for, 419
 —, poisoning by, 335
 Nitro-glucose, by M. Carey Lea, 381
 North London Society, 23, 82, 123, 173, 235, 234, 479, 501, 548, 595
 — or south, by N. K. Cherrill, 458, 536
 Notes on photographic subjects, by M. Carey Lea, 500
 — on the Continent, photographie, 331, 334, 405, 439
 Notman, William, photographic portraits, 390
 Novelties, photographic, 239, 279
 Nugent, E., a treatise on optics, 521
 Nuisances, photographic, 599

O

OBITUARY, 228, 539
 Obernetter, application of the collodio-chloride process, 457
 Old baths, 179
 — negative baths, by J. R. Johnson, a new method of treating, 93
 — negatives, by O. G. Mason, removing films and varnish from, 437
 — toning and fixing solutions, by Prof. Towler, resuscitation of, 21, 31
 Oldham Photographic Society, 70, 117, 166, 226, 284
 Omalium gatherum, remarks on various photographic topics, by Samuel Fry, 92
 One bath, toning and fixing in, 331
 Opalotypes, albumen, 69
 Opal glass, removing stains from, 371
 Opaque glue, 396
 Open air effects in the studio, on producing, by C. E. Pearce, 556
 Operating, by Fritz Haugk, practical hints on, 436
 Optical toy, a new, 334
 Ornamenting windows in studios, 263
 Osmotic motion, by W. J. Land, print-washing aided by, 511
 Out-door meeting, 443
 — photography, by J. R. Heaton, 175
 Oval masks for portraits, 432
 Oxford and Cambridge, 202
 Oxidation of potassium and sodium, 429
 Oxyhydrogen light, by J. Traill Taylor, and the means of preventing explosions, 103
 Ozone upon the latent image, the action of, 66
 —, formation of peroxide of silver, 572

P

PACKING cases, 617
 Panoramic apparatus for the field, by Camille Silvy, 212
 — camera, 334, 491
 — stereoscope, 206, 225
 Paper, photographic, 611
 — turning brown on development, 574
 Paraffine in encaustic paste, 445
 — in photography, the use, 595
 Paralysis among photographers, 419
 Parkesine, photography and, 60
 Past year, photography during the, 1
 Paste, adhesive mediums, a word or two in favour of, by a Practical Man, 174
 — and glue for mounting, preservation of, 14
 Patent artistic printing presses, 311
 Patent law reform, 131
 Pearce, Charles, hints on portrait photography, 592
 Pearce, C. E., on producing open-air effects in the studio, 556
 Penalties for piracies not debts, 290
 Pension to Lady Brewster, 131
 Permanency of collodion films, 311
 Permanent albuminized prints, 302
 — photographs, 299
 Permanganate intensifier, 346
 — of potash, 119
 —, by J. R. Johnson, further remarks upon the use of, 139
 —, manufacture of, 529
 —, restoring old baths with, 83, 93, 109, 122, 275, 310
 Peroxide of silver by ozone, by M. H. Woehler, on the formation of, 572
 Persistency of photographic images on glass, 59
 Perspective, distortion and, 473, 489, 536, 550

Personal luggage, 599
 Phenomena observed in the photographic image, on certain, by M. l'Abbe Laborde, 115
 — of light, 311
 Philadelphia Photographic Society, 274
 — Photographer, the, 16
 Phipson, Dr. T. L., sulphocyanide of ammonium, 414
 Phosphorescent photographs, 449
 — salts, 131
 Photo-block printing, 389
 — galvanometer, the, 107
 — lithographic reprints of rare books, 479
 — lithography, 226, 239, 515
 — micrographs, 520
 — photography, by T. Skaife, 419
 — relief prints, 131
 — process, Mr. Woodbury's, 182
 — zincography in practice, by J. Waterhouse, R.A., 230, 293, 306, 317, 340, 355
 — zincographs, national, 239
 Photometre, the new, by Dr. H. Vogel, 171
 Phototypes, 122, 515
 Photographer, An Old, Echoes of the Month, 5, 64, 111, 158, 207, 266, 312, 374, 434, 470, 539, 580
 —, the, 64
 Photographer's future, the, 431
 — widow, a, 527
 Photographic apparatus personal luggage, is a, 447
 — art studies, 515
 — evidence, 299, 347, 343
 — exhibition in Hamburg, 443
 — in London, 134
 — gallery, a novel, 537
 — identification, 181
 — invention, 155
 — marking ink, by H. Neale, 592
 — novelty, 239, 279
 — nuisances, 599
 — piracy, 213
 — preparations, on the sensitiveness of, 547
 — secret, a wonderful, 263
 — Society's Exhibition, the, 515
 —, new secretary, 578
 Photographing children, 156
 Photographs at the American Patent Office, 107
 — in an exhibition of paintings, 11
 — of historical documents, 59
 — of paintings, 24
 — of the Belgian Volunteers, 107
 — of the eclipse, 479
 — of the Royal Cornwall Polytechnic Exhibition, 485
 — on glass, a new method of etching, by Dr. Liesegang, 489
 — to measure, 587
 Photography and archaeology, 578
 — and branding, 494
 — and disease, 98, 117, 119, 130, 142, 157, 167, 170, 191, 382
 — and perspective, by N. K. Cherrill, 536, 473, 550
 — applied to mechanical printing process, by R. Griggs, 199
 — as a profession, by S. Thompson, 44
 — at the Havre exhibition, 539
 — at Wimbledon, 346
 — cannot lie, 280
 — in Egypt, 521
 — in Russia, 527
 — in South Africa, 134
 — in Upper Egypt, by Dr. Vogel, 569
 — made cheap and easy, 299
 — the best detective, 264
 — the last words of Sir David Brewster on, 139
 Pictorial art, the progress of, 311
 Pictorial effect in photography, 613
 — effect in photography, by H. P. Robinson, 40, 52, 67, 77, 88, 102, 112, 125, 133, 150, 167, 173, 185, 193, 209, 230, 243, 256, 270, 282, 295, 303, 317, 323, 339, 352, 366, 378, 390, 402, 412, 425, 437, 451, 463, 475, 489, 497, 521, 534, 546, 558, 570
 Pictures by the action of cold, by D. Winstanley, 603, 617
 — in a cup of tea, 290
 Piercy's patent method of artistic printing, 313
 Pignients, by G. Wharton Simpson, photographs in, 16
 Pinholes in dry plates, by Sebastian Davis, the cause of, 603
 Piety and informers, 332, 345, 358, 382, 407, 587
 —, more, 35, 71, 116, 131, 135, 207, 215, 251, 257, 333, 587
 — of engravings, extensive photographic, 615
 — of photographic copyright, 71
 Pirating Mr. Woodbury's process, 467
 Plain paper prints, simple plan of obtaining, 542
 — prints from aluminized paper, 563, 575

Plaster of Paris harder, how to make, 324
 Poisoning with hichromate of potash, 299
 Poisons, the new act to regulate the sale of, 263, 385, 587
 Political portraiture, 492
 Polytechnic exhibition, the, 513
 Pompellans, the immured, by J. Werge, 427
 Popularity, photography and, 539
 Portable apparatus for the field, by Henry Cook, 248
 — photographic laboratory, by Hippolyte Rochat, 322
 Portrait figures with natural backgrounds, 83
 — discovered, 575
 —, man's property in his own, 182
 — photography, by Charles Pearce, his'n on, 292
 Portraits *a la Salomon*, 119
 — of Adam Salomon, 432
 — on approval, 563
 — on graves, 574
 — with landscape backgrounds, double negatives, 325
 Portraiture on approbation, 533, 549
 Posing, instructions for, 532
 —, phenologically and psychologically considered, by John Beattie, 567
 Potassium salt, bromides in a collodion containing a, 265
 Practical experience with some dry-plate processes, 285
 — hints in working tannin plates, by M. P. Johannes Graus, 461
 — on operating, by Fritz Haugk, 436
 — Man, a, adhesive mediums, a word or two in favour of, 174
 —, studio hints, by a, 22
 — photography, theoretical and, by Homer Fellows, 176
 Practice of silver printing, 62
 Precipitate of chloride of silver, 407
 Preliminary coating of albumen in the wet process, 155
 Presentation print, competition for, 287, 395
 Preservation of collodionized plates in a moist condition, by General Mongin, on the, 258
 Preservative for collodio-bromide plates, new, 407
 — nitrate of silver, 47
 Preserving protosulphate of iron, 467
 Preventing explosions, by J. Traill Taylor, oxyhydrogen light, and the means of, 193
 Prevention of stains on negatives in hot weather, 337
 Price, on portraiture, Lake, 326
 Price's Manual of Photographic Manipulation, Lake, 314
 Prices of photographs in America, 8
 Printing bath, acetate of lead in the, 127
 —, by Arthur Taylor, description of an improved frame for photographic, 74
 — by development, 114, 300
 — formulae, 562, 574
 — in silver, theoretical and practical, by W. T. Bovey, 86, 122, 160, 157, 221, 253, 291, 304, 309, 511, 524
 — press, its use to photographers, by Thomas Gulliver, 593
 — process, by J. M. Watchhouse, rapid development, 568
 —, uranium and nickel, 434
 — room, our, by N. K. Cherrill, 542
 — upon ivory, by D. Duncan, two simple and practical methods of, 387
 — without chloride of silver, double salt for, 421
 Prints and aluminized paper, brilliant, 563
 — on approval, by Nelson K. Cherrill, 591, 616
 Print-washing aid by osmotic action, by J. W. Land, 511
 Pritchard, H. Baden, photography in connection with the Abyssinian expedition, 604, 614
 Prize portrait at the Royal Cornwall Polytechnic exhibition, 593
 Proceedings of Societies, 23, 31, 69, 82, 99, 105, 117, 128, 141, 166, 178, 188, 202, 222, 225, 236, 250, 261, 274, 284, 297, 370, 394, 430, 454, 465, 501, 548, 559, 593, 604, 616
 Production of photographic enlargements, by D. Winstanley, 54
 Progress of carbon printing, 497
 Property of gun-cotton, a newly discovered, 611
 Proportion of salt employed in aluminizing paper, the, 507, 538
 Protection for negatives, india-rubber as a, 445
 Publishing prints from purchased negatives, 502
 Pure white gutta-percha, 442

Q

QUEKETT Microscopical Club, 419
 — soiree, 143

R

RAILWAY carriers, photography and the, 24
 Raphael reproductions, 180
 Rare books, photolithographic reprints of, 479
 Reaction of hyposulphites and sulphocyanides upon albumen prints, 453
 Recent patents, 212, 248, 322
 Recovery from cyanide poisoning, 338
 Rectifying alcohol by means of gelatine, 432
 — baths, 129
 Red colouring matter, new, 344
 Redevelopment by nitrate of silver and citric acid, 234
 Reducing chloride of silver, by Dr. Graeger, on a wet method of, 79
 Reduction of the sesqui-salts of iron and protosalts, 388
 Rees, H., the art of photographic colouring, 219
 Reissig, Dr. W., remarks upon the retouching of negatives, 428
 Relief fund, photographic, 122, 491, 505, 520, 537, 549, 562, 572, 578, 585, 598
 Relief in art, 407
 Removing silver stains from opal glass, 371
 — the varnish and collodion film from old negatives, by G. Mason, 487
 — varnish from a collodion film without injury, by V. G. Bloede, 128
 Report of the Council of the Photographic Society, 94
 Reproduction of engravings and line drawings, by F. Fink, 320
 — of old engravings, photographic, 219
 Reproductions of works of art of all countries, 461
 Rescarches on dry processes, by Carey Lea, 80
 — on the hyposulphites and other fixing agents, by John Spiller, F.C.S., 29
 Residues, on a new and simple method of recovering metallic gold and silver from, by G. Victor Bloede, 272, 331
 Respite Finem, art teaching and art study, 487
 Restoration of the negative film, on the, 362
 Restoring old baths, permanganate of potash for, 85, 109, 122, 310
 Resuscitation of old toning and fixing solutions, by Professor Towler, 21, 31
 Retouching negatives, 333, 365, 371, 428, 544
 — of M. Adam-Salomon's pictures, the, 254
 — photographs, by Grasshoff, 518
 Rentlinger's studio in Paris, 448
 Robinson, H. P., pictorial effect in photography, 40, 52, 67, 77, 88, 102, 112, 125, 136, 150, 162, 173, 183, 198, 209, 222, 230, 242, 255, 270, 282, 295, 303, 317, 328, 339, 352, 366, 378, 390, 402, 412, 426, 437, 451, 462, 475, 487, 497, 521, 534, 546
 —, H. P., producing pictorial effects in photography, 558, 570
 Robinson's "Returning Home," 447
 Rochat, Hippolyte, photographic laboratory, portable, 322
 Royal diary, the, 228
 — photographers, 323
 — Society of Medical and Natural Sciences of Brussels, 263
 Rue's, Warren de la, photographs of the moon, 264, 273
 Ruinous competition, 347
 Russia, photography in, 527

S

SALE of poisons, 263, 587
 Salomon, M. Adam, 35
 — in London, 397
 Salomon's, M. Adam, formula, encaustic paste, 433
 — pictures, the retouching of, 254
 — portraits, an American estimate of, 59
 — portrait, 83, 106, 432
 — portraits, an art critic on the lighting and touching of, 38
 — studio, 42, 48, 62
 Salt in aluminizing paper, the proportion of, employed, 507
 — in aluminized paper, proportion of, 573
 Salting formulae of aluminized paper, 525
 Salts of silver, by Prof. Morren, on a peculiar action of light upon the, 416
 Sampson, H., sunsets on the sea, 5
 Sarony's studio at Scarborough, 110
 Sawyer's studio at Norwich, 555
 Schrank, Ludwig, on the employment of collodionized paper, 476, 488
 Science of the sunbeam, the, 167
 Scientific education, 143
 — gleanings, 345
 — Opinion, 503, 539
 Seals, photographic, 351

Secretary of the Photographic Society, the new, 578
 Secret writing, chloride of gold for, 215
 Seduction in a photographic studio, 107
 Seely, Ed., experiments, intentional and otherwise, 563
 Sel Clement, or preservative nitrate of silver, 47, 145, 213, 226, 262, 439
 Sensitive aluminized paper preserved ready for use, 337
 — development printing process, 523
 — salt for photographers, fluoride of silver, 26
 Sensitiveness in dry plates, loss of, 170
 — of photographic preparations, on the, 547
 Separating gold from silver, 834
 Short essays on art and photography, by Respite Finem, 487
 Silvering iron wire, 372
 Silver printing, 62, 106
 — soap as a sensitive agent, 25
 Silvy, Camille, panoramic apparatus for the field, 213
 Simplified manipulations in carbon printing, 277
 Simpson, G. Wharton, glass for photographic purposes, and the changes of colour to which it is subject, 75
 —, photographs in pigments, 16
 —, the YEAR-BOOK OF PHOTOGRAPHY, 17
 —, James, method of enlarging, 249
 Skaife, T., photo-zincography, 418
 Sketches of travel from a sun-painter's portfolio, by Stephen Thompson, 267, 363, 401, 459
 Small negatives and enlarged prints, 278
 Smyth's, Prof., great pyramid bath, by Dr. Mann, 296
 Soap in collodio-bromide of silver, another new dry process, 17
 — in dry collodion, 35
 Solar eclipse, the, 107, 299, 311, 396, 419, 562
 — enlargements on canvas, 179
 — heat as a motor, 299
 — printing by development, 453
 — on canvas, 272
 Solomon's, Mr., lamp at Falmouth, 527
 —, enlarging by a magnesium, 127
 Sources of success in operating, 227
 South Kensington, photography at, 71
 — light, 491
 South London annual dinner, 587, 611
 — London Photographic Society, 31, 95, 141, 167, 188, 250, 297, 502, 559, 575, 608
 Spectrum reconstructed, 324
 Spiller, F.C.S., J., egg albumen from a chemical point of view, 176
 —, Mr. McLachlan's nitrate of silver, 254
 —, observations on Mr. McLachlan's process, 195
 —, on the occurrence of hyposulphites in mounting cards, 220
 —, researches on hyposulphites and other fixing agents, 29
 Splitting of films, 107
 Sponging, waxed prints, 431
 Spots in prints, another cause of, 11
 Stability of negatives intensified with iodide of mercury, the, 451
 Stains on negatives, 347
 — on tannin plates, 347
 — on negatives in hot weather, 337, 347
 Status of photography, 527
 Stereoscope, by Valentine Blanchard, some remarks on the, 499
 Sternberg, M. C., a rapid enlarging process, 490
 — the wet collodion process, 356
 Stippling the glass of studios, 22, 47
 Stopping out skies, &c., 275
 Stops, influence of shape of aperture, 263
 Strengthening negatives by heat, 251
 Strengthen varnished negatives, to, 538
 Strutt, Hon. John W., diffusion of focus, 483
 Studio accessories, 587
 —, by C. E. Pearce, on producing open air effects in the, 556
 — hints, by A Practical Man, 22
 —, the use of a second, 15
 Studios and processes in America, 495
 —, by Dr. Vogel, on the principle of lighting and construction, 329, 342, 379
 —, visits to noteworthy, 42, 48, 62, 90, 110, 184, 409, 422, 448, 555
 Substitute for ground glass, new, 373
 — for nitrate of silver, another, 419
 Sugar in the printing bath, 23, 120, 227, 454
 Suicide with cyanide, 263
 Sulphocyanides, by M. Criviale, observations on the employment of, 223
 Sulphocyanide of ammonium, by Dr. Phipson, F.C.S., 414
 — toning, 250
 Sulphur in the mounting boards, 169
 Sun, constitution of the, 575
 Sun-painter's portfolio, by Stephen Thompson, sketches of travel from a, 267, 363, 401, 459
 Swan's carbon process, 242

Swing, tilt, or level, by John Towler, M.D., 513
 Syphon, eccentricities of, 352
 —, automatic, 456
 Talk in the Studio, 11, 23, 35, 47, 59, 71, 83, 96, 106, 119, 131, 143, 155, 167, 179, 191, 203, 215, 227, 251, 262, 273, 287, 299, 311, 323, 335, 346, 359, 371, 383, 395, 406, 419, 432, 443, 455, 467, 479, 491, 503, 515, 526, 539, 551, 563, 574, 587, 599, 611
 Tannin plates, keeping properties of, 179
 —, practical hints in working, by Johannes Graus, 461
 —, stains on, 347
 Tasmania, photographic souvenir of, 167
 Tax on the sun, 82
 Taylor, A., description of an improved frame for photographic printing, 74
 —, J. Traill, concerning the oxyhydrogen light, and the means of preventing explosions, 103
 Temporary varnish for negatives, 455
 Terry, William A., collodio-chloride, 224
 Test for bromides, 218
 —, for the presence of a free acid, 143
 Theatre, photography in the, 602
 Theodore's son, photographs of, 247, 454
 Theoretical and practical photography, by Homer Fellows, 177
 Thomas, F.C.S., R. W., the modern practice of photography, 219
 Thompson, S., photography as a profession, 44
 —, Steven, sketches of travel from a sun-painter's portfolio, 267, 363, 401, 459
 —, the late C. Thurston, 35
 Toncs, black, 491
 Toning collodion prints, 349
 —, and fixing bath, by Nelson K. Cherrill, hyposulphite of ammonia and the mixed, 66, 137
 —, and fixing in one bath, 331
 —, and fixing solutions, by Prof. Towler, resuscitation of old, 21, 31
 —, bath, the old, of hyposulphite of soda and gold, 14
 —, a neutral, 299
 —, a valuable, 339
 —, of sulphocyanide and hyposulphite of gold, 443
 —, modes of, 311
 Touching and lighting of M. Salomon's portraits, an art critic on the, 33
 Touch, or not to touch, to, 131
 Towler, Professor, M.D., resuscitation of old toning and fixing solutions, 21, 31
 —, American scenery, 5
 —, con-elliptical vignettes, 442
 —, on the coffee process, 452
 —, swing, tilt, or level, 513
 Transferring carbon and other tissues, a modification in, 229
 —, enamels, removing the collodion film used in, 275
 —, negatives, by Walter B. Woodbury, on, 425

Transformation of photographic images in silver into other metals and combinations, by Will helm Grune, 244
 Transmission of actinism by glass, 310
 Transparent designs on paper, producing, by W. B. Woodbury and R. H. Ashton, 248
 —, metal, 396
 Transparencies on dry plates without cutting the negative, printing, 523
 Tunnel, photographing the interior of, 263
 Tyndall, John, on a new series of chemical reactions produced by light, 553, 571, 584

U

UNCERTAINTIES of dry processes, 447
 Uneven drying of sensitized paper, 251, 508
 Uranium and nickel printing process, 434
 —, salt for positive printing and measuring the actinic force of direct sunlight, 283
 Use of common water in photography, the, 133
 Utilizing old negative baths, 179

V

VARIETIES in the qualities of the collodion, a new cause for, 479
 Varnish for negatives, 471
 —, temporary, 288, 455
 —, from a collodion film without injury, by V. G. Bloede, removing, 128
 Varnished negatives, to strengthen, 538
 Varnishing, 22
 —, albuminized paper, 311
 Vegetable poisons, antidote to, 497
 Ventilation of dark rooms, 144
 Vienna, a visit to the photographic studio of the Imperial Military Geographical Institute in, by Alois Nigg, 592, 605
 Vignetting in the camera, 131
 Vignettes, con-elliptical, by Prof. Towler, 442
 Vitrified india-rubber sheet, 66, 205
 Vogel, Dr., on retouching negatives, 565
 —, principles of lighting and constructing studios, 329, 342, 379
 —, recent experiments with collodion, 413
 —, remarks on the carbon process, 209, 398
 —, the new photometer, 171
 —, photography in Upper Egypt, 569

W

WANTED, a man, by H. P. Robinson, 424
 Warming the dark room and chemicals, 589
 Warner, W. H., local sketches illustrated by photographs, 219
 Washing machine, 371
 —, eccentricities of a syphon, by N. K. Cherrill, 352

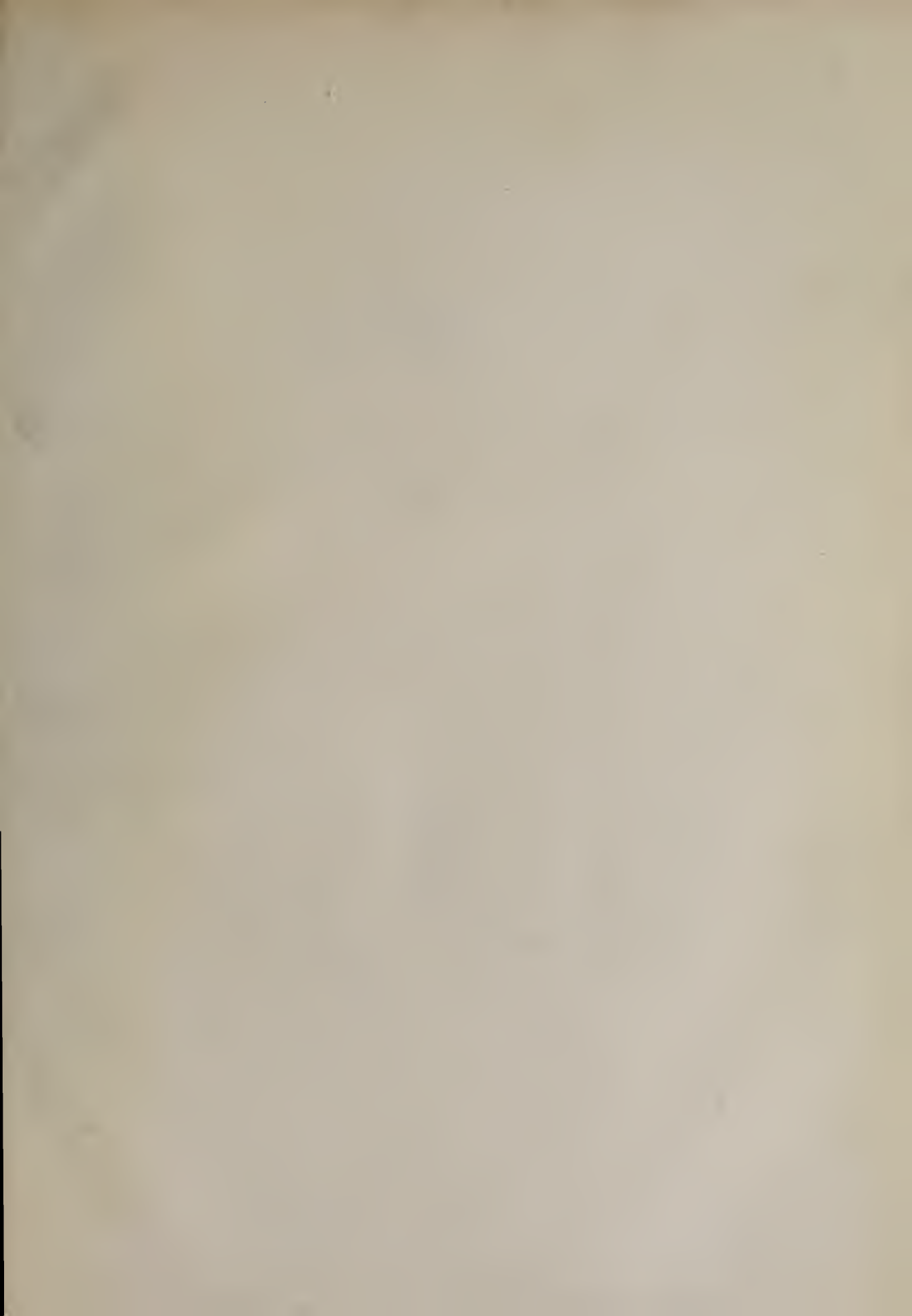
Washing sensitive plates, 602
 Watching the lark, 601
 Water, common, for nitrate bath, 119
 —, in photography, the use of, 133
 Water expand on becoming ice, docs, 551, 584
 Waterhouse, J. R. A., photo-zincography in practice, 280, 293, 305, 317, 340, 355
 —, J. M., rapid development printing process, 568
 Water, wet collodion without, 457, 470, 478, 490
 Waxing prints, simple method of, 122
 —, the plate-holder, 455
 Weak baths, 503
 —, prints, curious cause of, 120
 Weather and photography, the, 346
 Wedding cards, 492
 Werge, J., photography and the immortal Pompeians, 437
 Wet collodion process, by Mr. McLachlan, remarks upon the, 245, 259
 —, process, by C. Sternberg, the, 356
 —, without water, 457, 470, 478, 491
 —, method of reducing chloride of silver, by Dr. Graeger, on a, 79
 —, photography in the field, 490
 —, photography in the field without a tent, 310
 —, process, preliminary coating of albumen in the, 155
 What is passengers' luggage, 467
 White gutta-percha, on pure, 442
 —, pigment in carbon printing, 496
 —, pigment, new, 611
 Whites of albuminized prints, the elimination of silver from the, 61
 Wichelhaus, on the action of bromine upon certain ethers, by M.M. A. Ladenberg and H. 343
 Williams's studio, Mr. T. R., 80
 Winstanley, David, on the economic use of artificial light, 245
 —, pictures by the action of cold, 603
 —, the production of photographic enlargements, 34
 Woodbury, Walter, a simple method of double printing, 42
 —, on transferring negatives, 425
 Woodbury's patent, 299
 —, photo-relief process, 182
 —, process, pirating, 467
 Woodbury, W. B. & H. R., producing transparent designs on paper, 248
 Woehler, M. H., on the formation of peroxide of silver by ozone, 572
 Workers in photography, inkblings from the, by John H. Hattenbach, 233

Y

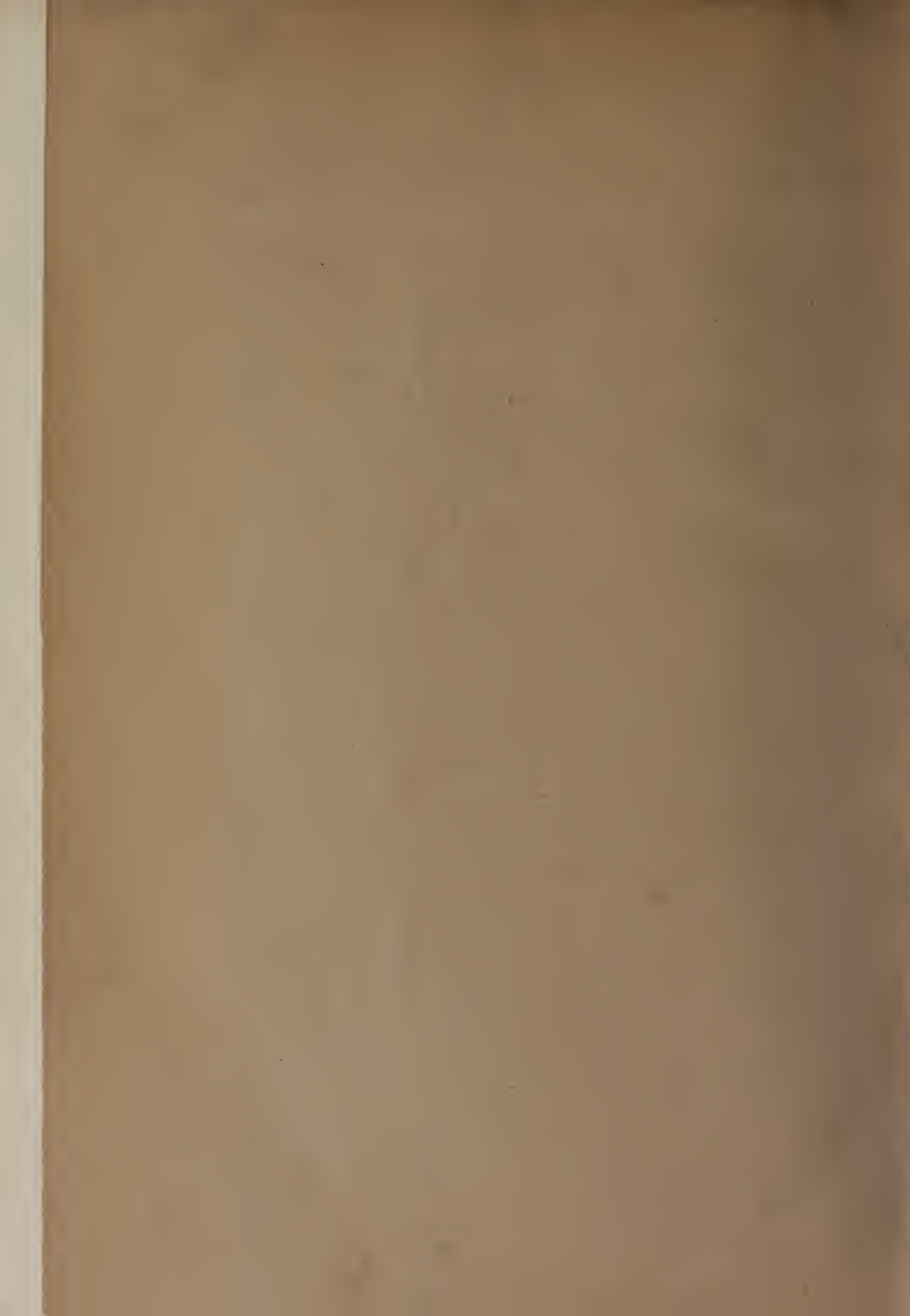
YELLOW negatives, new method of intensifying, 181
 —, spots on prints, imperfect fixation, 499

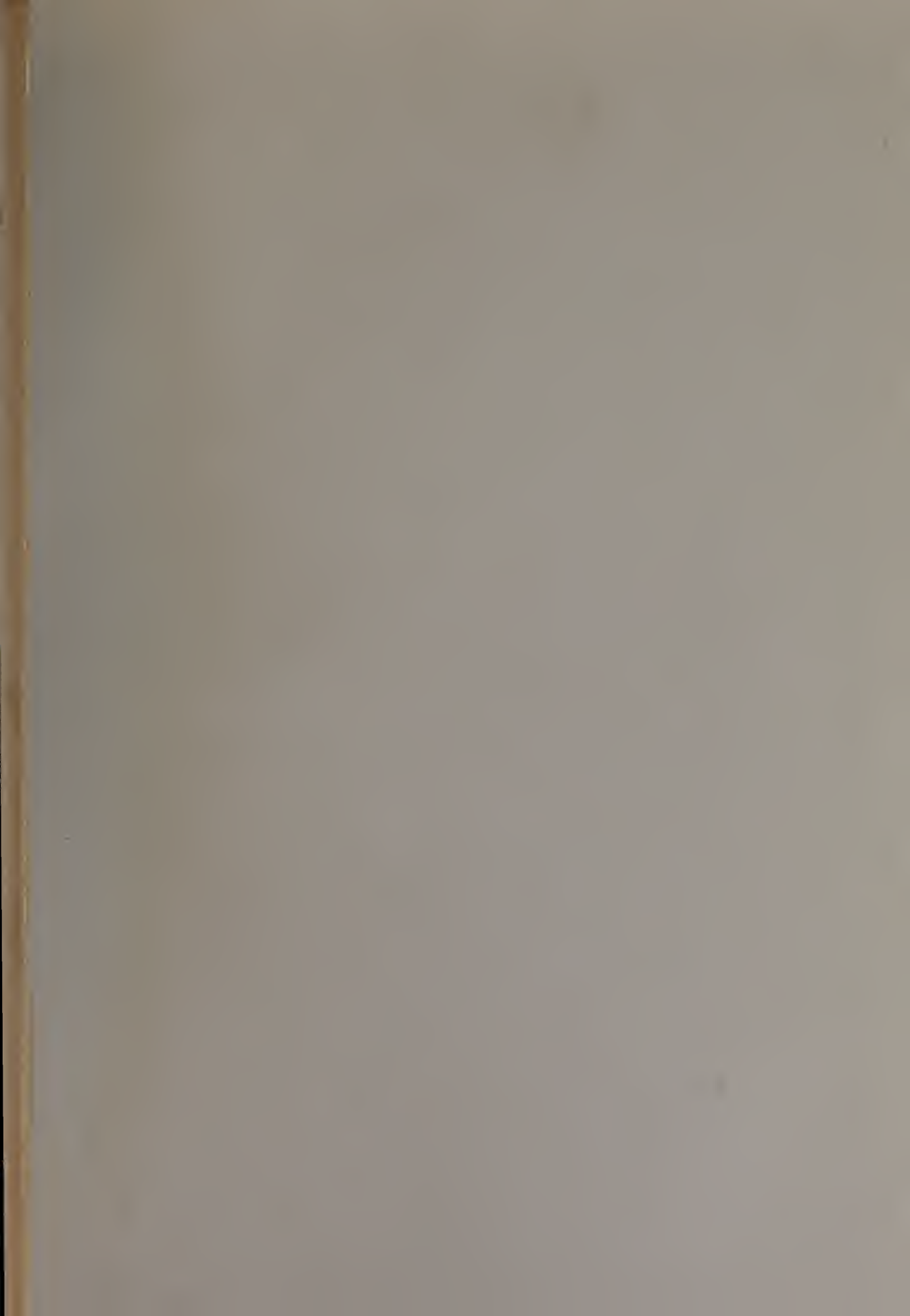


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